Journal
OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

AVMA Convention—Cleveland, August 19-22, 1957

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Correspondence

May 30, 1957

Dear Sir:

I was interested in the article "Rabies in Wildlife in Middle America" by Aurelio Malaga-Alba (*J.A.V.M.A., 130,* (1957): 386). Unfortunately, the Bahamas are included in table 1 as being positive for rabies in dogs.

Examination of the reports and literature in this department, since 1945, has shown that rabies has not occurred in these islands since that date and it is unlikely that it was present earlier. The law relating to importation of dogs is rigidly enforced.

Dogs from a country known to be free from rabies are admitted into the Bahamas if accompanied by a certificate from the Animal Disease Control Bureau of that country. Dogs from any other country must be accompanied by a certificate of vaccination from a registered veterinary surgeon in the country of origin—vaccination to be carried out not more than nine months prior to entry.

A health certificate stating that the dog is free from signs of infectious or contagious disease, issued not more than 24 hours before departure, should also accompany the dog. The same conditions apply to cats.

Yours truly,
s/L. N. Owen, B.V.Sc., F.R.C.V.S.
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Internal Public Relations

As a service to its members and constituent associations, the **AVMA Public Relations Department** is developing a series of **Speaker's Kits** to assist veterinarians who are invited to speak before various groups.

Two kits are currently available. Their respective titles are: **"It Takes More than Treatment to Control Mastitis"** and **"Veterinary Medicine in Our Modern World."** A third kit now in production is called **"An Ounce of Prevention."**

The objective of these kits and others to be developed is to aid AVMA members and AVMA constituent associations in their efforts to mold a favorable public opinion of veterinary service at state and local levels. This reflects the basic AVMA concept that effective public relations is largely the responsibility of the individual veterinarian at the proverbial grass roots level.

The benefits derived from participation in programs sponsored by P.T.A.'s, schools and colleges, service clubs, 4H clubs, F.F.A. chapters, etc., are many. Outstanding, however, will be the recognition that leadership in the control and prevention of animal diseases falls rightfully into the veterinarian's domain. While this is not the complete answer to our public relations problems, it is a sound step in the right direction.

Kits may be obtained from the AVMA, 600 South Michigan Ave., Chicago 5, Ill. These are loaned to AVMA members with the request that they be returned as soon as possible, since only a limited number are available for distribution.

Special Preconvention Session at Cleveland to Highlight Veterinary Public Relations

The Public Relations Conference, to be held this year on Sunday, August 18, in Cleveland, during the AVMA's 94th Annual Meeting, will stress the importance of internal public relations activities (see p. 13, July 1, 1957, JOURNAL, for complete program).

Internal public relations, as the name implies, concerns itself with activities conducted within the profession by its individual members and component societies. The purpose of the AVMA's internal PR efforts is to render the greatest possible assistance to its members directly and indirectly, through its 63 constituent associations, in attaining our over-all objective of creating increased appreciation and acceptance of the veterinary profession as a whole.

Constituent association secretaries, public relations chairmen and committee men, Women's Auxiliary PR workers—anybody concerned with veterinary public relations activities—is cordially invited to attend the Preconvention Conference.

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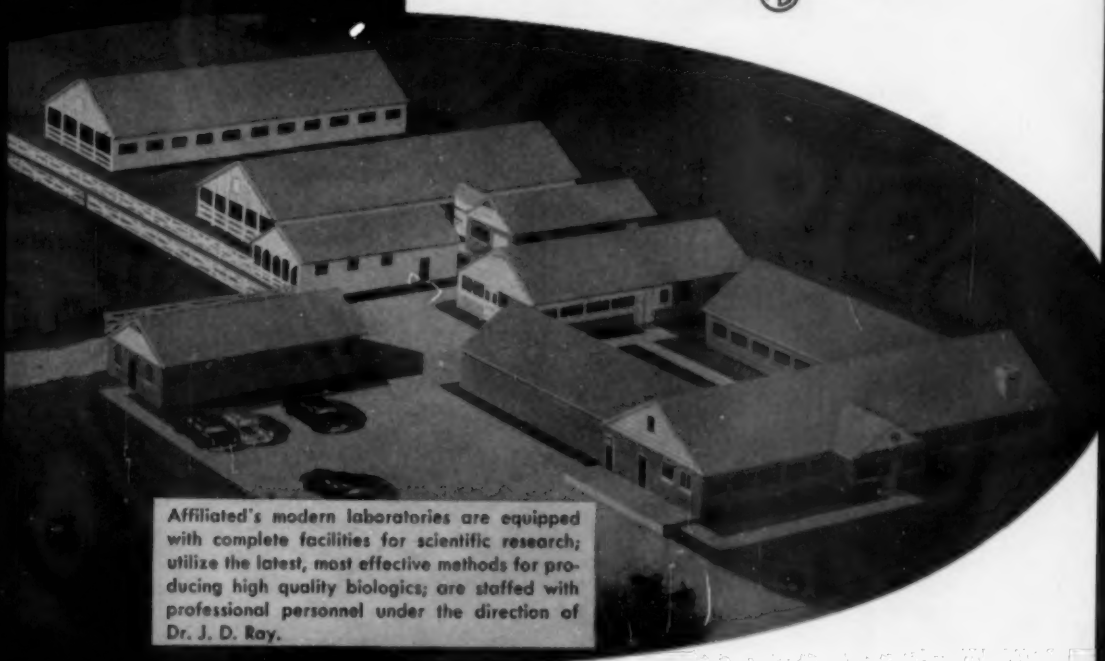

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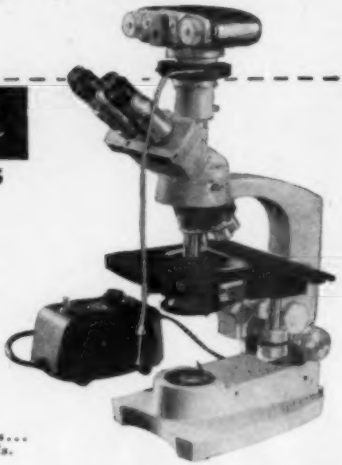

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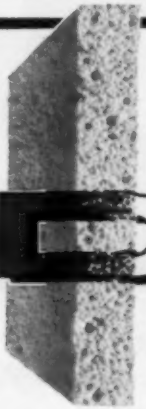

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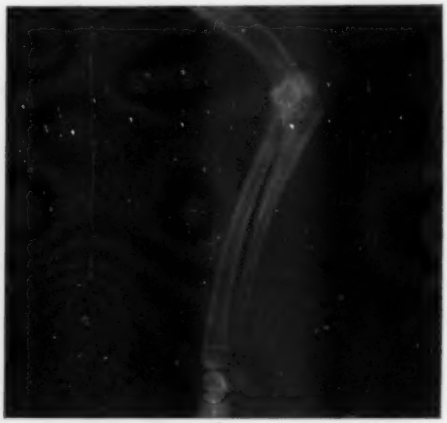

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In hot summer weather, special precautions should be taken to ensure top-quality radiographs. If the temperature of the developer rises above 74° F, 2½ ounces of sodium bicarbonate should be added to the solution for each gallon of tank capacity. This serves as a restrainer and minimizes the possibility of chemical fog.

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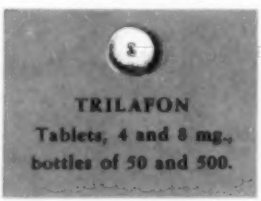

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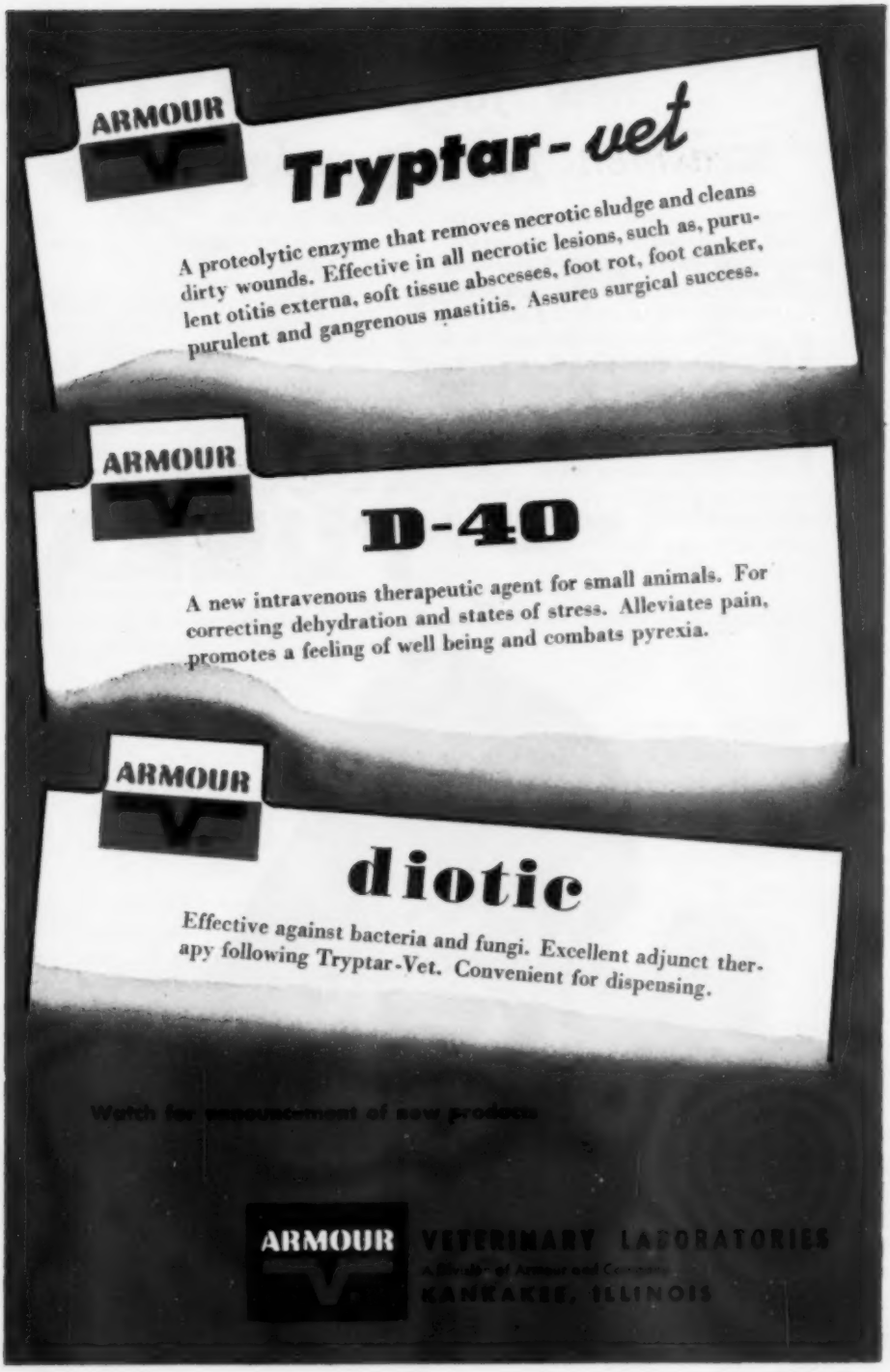
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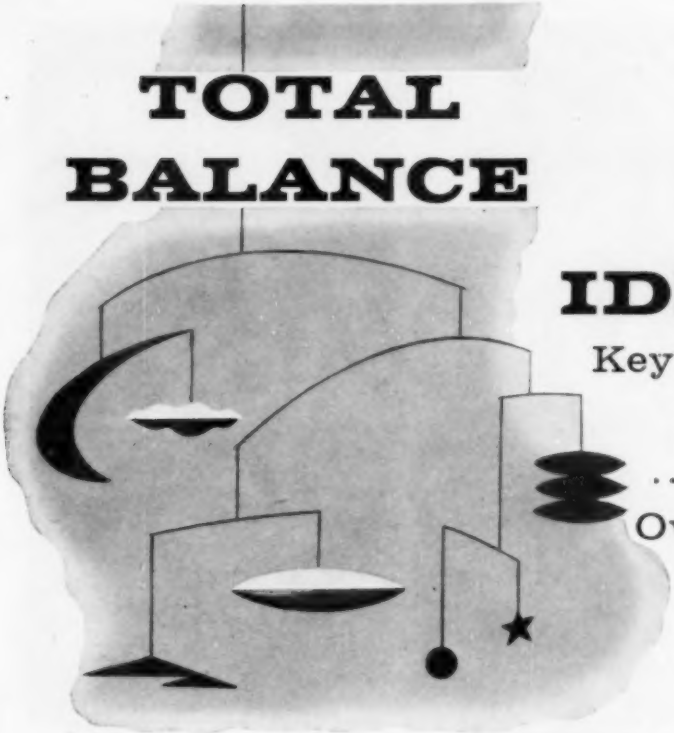

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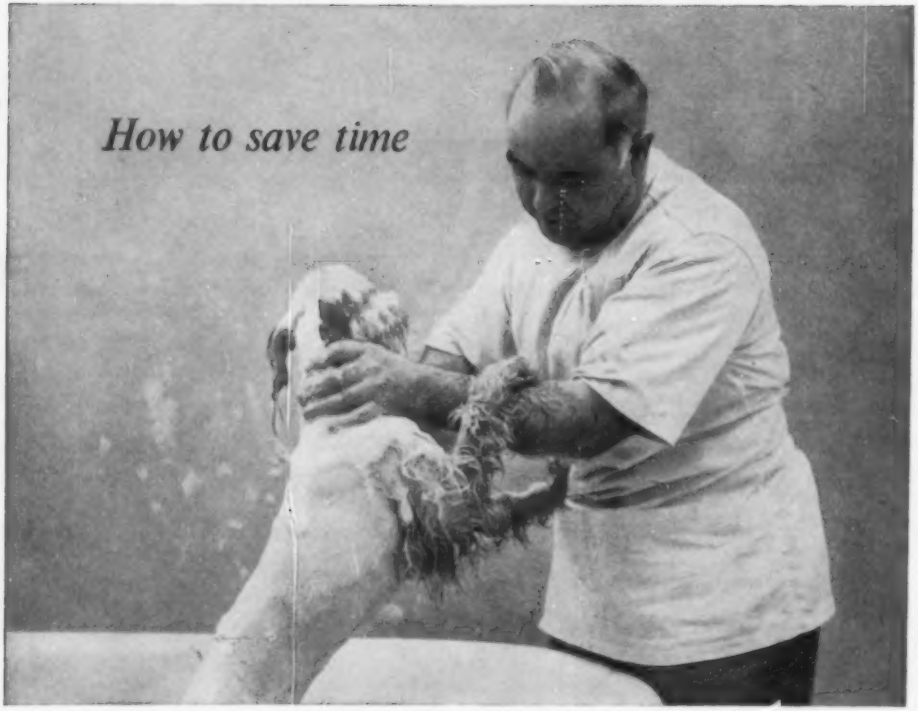

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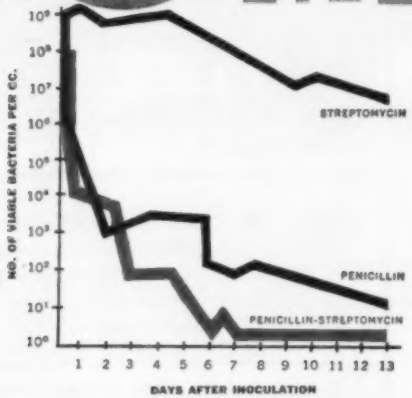
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1. Welch, H.: Antibiotic Med. & Clin. Therapy *3*:375 (Nov.) 1956. 2. Adapted from Hunter, T. H.: J.A.M.A. *144*:524 (Oct. 14) 1950.

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Studies on the Epizootiology of Shipping Fever in Calves

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Lincoln, Nebraska

THE NAME "shipping fever" is applied to several different clinical syndromes which occur in cattle following shipment. This report deals with the characteristic form of the disease which is seen in beef calves several days after shipment from the ranch areas, where they were produced, to middlewestern feedlots. A similar clinical condition often follows the weaning and moving of calves to different quarters on the ranch.

The disease is primarily respiratory and varies from an inapparent disease to a rapidly fatal pneumonia. Typically, the affected calves exhibit considerable depression; they stand alone with their heads down and ears drooping. They have a gaunt appearance, due to anorexia. They may have a high fever, either a dry nose or mucopurulent nasal exudate, a soft cough, and an increased respiratory rate. In some epizootics of shipping fever, diarrhea is prominent. Even mildly affected calves often lose a great deal of weight and condition during the first two weeks following shipment.

Affected animals usually recover in several days to a week, often without treatment. However, those acutely affected may die in less than 24 hours. Chronic pneumonia results in some cases and may terminate fatally after several weeks.

In spite of the serious losses from shipping fever, relatively little progress has been made in determining its cause. Early studies[1] suggested that bacteria of the genus Pasteurella were the cause of the disease, since they could commonly be isolated from the lungs of cattle with shipping fever. On further investigation,[2] however, these bacteria did not appear to differ from those found in normal cattle. Experimental transmission of the disease has not been accomplished with the pasteurellas or with other bacteria isolated from the respiratory tract. "Vaccines" (bacterins and aggressins) and antiserums made from Pasteurella sp. have not prevented shipping fever, although they have been widely used.[3] Since the sulfonamides and antibiotics are effective in treatment of shipping fever,[4] it would appear that bacteria are of importance as secondary invaders.

Pleuropneumonia-like organisms (PPLO) have recently been recovered from animals with shipping fever but their significance as a cause of the disease is in doubt.[5] It has been suggested that a virus may be a primary factor but no viruses have been demonstrated. The fact that treatment with sulfonamides and antibiotics is successful does not eliminate a virus as a primary cause since secondary bacterial invaders may well be responsible for the signs and serious sequela of the disease. These drugs do not have prophylactic value when given before shipment.[6]

During the process of shipping, cattle are exposed to unusual factors, such as cold, fatigue, and change of feed and water. These factors, while thought to be important in the development of shipping fever, have not been evaluated singly by controlled experimentation. During shipment, cattle also contact, directly or indirectly, other cattle in public stockyards and in common transport carriers.

From the Department of Animal Pathology and Hygiene, University of Nebraska, Lincoln.

Published with the approval of the director as paper No. 807, journal series, Nebraska Agricultural Experiment Station.

The authors thank the Animal Husbandry Department, University of Nebraska, for their cooperation in making calves and facilities available for these studies.

TABLE I—Summary of the Temperature Data from the Four Groups of Calves Studied During the Two Years

			Days postshipment											
			1	2	3	4	5	6	7	8	9	10	11	Total
1955														
1 72 calves (Herd A)	No. calves having temperatures > 104 F. for the first time.		0	0	1	6	6	6	6	3	13	7	3	51 (70.8%)
	Total No. calves with temperatures > 104 F.		0	0	1	7	10	11	14	9	29	22	17	
	Mean temperature calves < 104 F.		101.2	102.1	102.2	102.5	102.8	102.8	102.8	101.5	102.1	102.3	102.6	
2 124 calves (Herd B and C)	No. calves having temperatures > 104 F. for the first time.		0	0	8	33	16	20	12	7	1	3	.....	100 (80.6%)
	Total No. calves with temperatures > 104 F.		0	0	8	35	39	39	40	36	21	28	.....	
	Mean temperature calves < 104 F.		101.5	101.5	101.9	102.8	102.3	102.4	102.3	101.8	101.4	101.8	.....	
1956														
3 58 calves (Herd A)	No. calves having temperatures > 104 F. for the first time.		1	2	2	3	0	2	1	0	1	2	.....	14 (24.1%)
	Total No. calves with temperatures > 104 F.		1	2	2	3	0	2	1	0	2	3	.....	
	Mean temperature calves < 104 F.		103.1	101.9	101.6	101.9	102.1	102.3	102.1	102.1	101.6	102.1	.....	
4 181 calves (Herd B and C)	No. calves having temperatures > 104 F. for the first time.		14	13	7	7	5	11	9	14	14	6	5	105 (58.0%)
	Total No. calves with temperatures > 104 F.		14	13	7	8	5	14	14	17	21	13	10	
	Mean temperature calves < 104 F.		102.9	102.5	102.6	102.4	102.5	102.7	102.4	101.9	102.3	101.9	101.9	

The studies here reported were designed to provide basic information concerning the pathogenesis of shipping fever and to demonstrate possible viral agents in cattle after shipment from the ranch to feedlot areas in the corn belt.

EXPERIMENTAL PROCEDURE

These studies were made during the fall seasons of 1955 and 1956, using several groups of 400- to 450-lb. Hereford steer calves, about 6 months old, which were shipped 250 miles from ranches in the Nebraska sandhill area to Lincoln, Neb. The Animal Husbandry Department, University of Nebraska, had procured experimental feeder calves, which often developed varying degrees of shipping fever, from these ranches for several years.

The usual procedure for shipment of feeder calves from the western ranch areas was followed. The cows and calves were brought in from pasture to a central loading and sorting area. The calves were separated from the cows, sorted, weighed, loaded into trucks, and brought directly to the university feedlots at Lincoln. The trip was accomplished in five to six hours. In both years, the calves were transported during mild weather and were exposed to no unusual conditions as they were hauled.

For the first ten days at the university feedlots, while being handled as quietly as possible in a line chute, the rectal temperature was taken daily on each calf. Quick-reading electronic thermometers were used. Temperatures over 104 F. were considered abnormal.

At the time of the first high temperature, blood samples and nasal exudates were collected aseptically and immediately quick-frozen in a dry ice and alcohol bath and later stored in a mechanical freezer chest at −65 C. until used in experimental transmission studies. Blood counts and biochemical studies were made on blood from certain affected calves, including analyses for glucose, protein, nonprotein nitrogen, calcium, and magnesium.

As the disease became pronounced, the sick animals were treated but usually not unless severe signs of illness were present together with fever of two or three days' duration. The usual treatment consisted of a combination of sulfamerazine and sulfathiazole (32 Gm.) given by mouth. In a few severe cases, this treatment was reinforced with sulfonamides given intravenously (220 ml. of 7.5% sulfamerazine and 7.5% sulfathiazole solution).

Experimental transmissions were attempted by inoculating dairy calves, 3 to 4 months old, with blood and nasal exudates collected during the "acute" or high temperature phase of the disease in the feedlot calves.

RESULTS

During the fall of 1955, two groups of calves were studied. Group 1 consisted of 72 calves from herd A and was kept separate from group 2 which consisted of 124

calves from herds B and C. Several calves in each group had a nasal discharge on arrival. As time went on, an increasing number of calves showed listlessness, depression, soft cough, nasal discharge, and accelerated respiration. Temperatures over 104 F. appeared in both groups on the third day after shipment (table 1). Calves with elevated temperatures, as high as 107 F., often had no visible signs of disease. Many of the calves (25 of 51 in group 1, 44 of 100 in group 2) had temperatures over 104 F. for only one day. Eighteen of the 25 in group 1 and 38 of the 44 in group 2 were not treated. A smaller number of calves had temperatures over 104 F. for two days before returning to normal. Some calves had signs of shipping fever, but did not have elevated temperatures. By the eleventh day, 51 (70.8%) of the 72 calves in group 1 and 100 (80.7%) of the 124 calves in group 2 had had temperatures over 104 F.

Blood samples for blood counts were taken from 11 calves on the first, second, and fourth days after the initial high temperature. No change in blood counts was found in 2, but a constant pattern of leukocyte change occurred in the other 9 calves (table 2). The neutropenia present in these calves on the second day was more pronounced on the fourth day. In some animals, a drop of 90 per cent in neutrophils occurred between the first and second day, while in others the greater change was present by the fourth day. There was a slight lymphocytosis by the fourth day.

In 1955, 62 calves, which had not had temperatures of 103 F. or higher by the sixth day after shipment, were randomly allotted to three groups to determine what effect antibiotic and sulfonamide treatment might have on the herd epizootic at this stage of development. In the first group, the 19 calves were each given 500,000 units of procaine penicillin in oil parenterally, followed by a similar injection two days later. The 10 calves in the second group were each given 500,000 units of procaine penicillin plus 32 Gm. of a combination of oral sulfonamides, followed in two days by 500,000 units of procaine penicillin. The control group of 23 calves was not treated. Sixteen (70%) of the 23 untreated control calves developed temperatures over 104 F. during the next five days, while only 4 (13.8%) of the 29 calves treated (3 of the 19 with penicillin alone, 1 of the 10 treated with penicillin and sulfonamides) later had temperatures over 104 F.

A number of animals in the 1955 trials developed severe cases of shipping fever. Treatment probably saved several and prevented serious loss in weight and condition in others. The sulfonamides seemed more effective than penicillin in these cases.

In 1956, two groups of calves (groups 3 and 4, table 1), which came from the same ranches as did the 1955 trial groups, were studied under conditions similar to those of the year before. Signs of shipping fever were much less common and fewer calves had temperatures over 104 F. than in the preceding year (table 1). Fourteen (24.1%) of the 58 calves in group 3 and 105 (58.0%) of the 181 calves from group 4 had temperatures over 104 F. As compared with the previous year, the number of calves developing high temperatures each day was more constant, without a definite peak occurring.

The calves on which blood counts were made during the 1956 trials did not have the constant pattern of leukocyte change observed the previous year. Of the 17 calves studied, only 8 had the marked drop in neutrophils, characteristic of the calves in 1955, while neutrophil counts increased in 2 and changed little in 7 animals.

One calf from group 4 was found dead on the morning of the fourth day after shipment and another on the sixty-fifth day. At necropsy, the first showed an old pneumonia with fibrous adhesions. The second had peritonitis, which possibly could have been related to old pneumonia lesions

TABLE 2—Mean Leukocyte Counts on 9 of the 11 Calves Sampled Starting with the Initial Temperatures over 104 F.

Temperature	Leukocytes per cubic millimeter of blood		
>104 F.	Total	Neutrophils	Lymphocytes
First day	9,646	3,266	6,380
Following day	7,593	1,114	6,479
Fourth day	9,328	668	8,660
Calves (17) having no previous temperature elevation	11,418	2,689	8,729

which were present. Only 6 calves from the two groups were treated with sulfonamides.

Biochemical examinations made on the blood of calves which had elevated temperatures with or without other signs of shipping fever showed no significant differences from normal calves.

Experimental transmission trials were made using blood and nasal exudates procured at the time of high temperature or of other signs of illness. Intravenous, subcutaneous, and intranasal inoculations were made in 9 calves. Blood counts were made daily and temperatures taken twice daily. No evidence of disease was observed in these experimental calves.

DISCUSSION

The etiological factors in shipping fever are apparently a complex composed of several elements. The process of shipping animals from ranch to feedlot is in itself complicated: introducing circumstances involving physical environmental factors, such as cold, inhaled dust, and trauma; abnormal physiological elements, such as fatigue and change of feed and water; and disturbing psychological factors, such as fright and anxiety.

The hypothesis of a virus, perhaps latent, being activated by the "stress" of shipment to make a favorable environment for secondary bacteria finds some support in these experiments. The occurrence of elevated temperatures in the calves suggests the contagion of an infectious agent. The changes in the leukocyte counts are similar to those seen in some viral infections. If such an infectious agent exists, it could be common in cattle populations, perhaps producing clinical disease only under special conditions.

Previous exposure resulting in immunity could explain failure of experimental transmission attempts. The experimental calves may not have been susceptible because they were not "stressed" prior to artificial inoculation. The agent, if one exists, may not have been present in the blood or nasal exudates as procured or may have been destroyed by freezing before use. The route of inoculation may have been inadequate.

Several features of the disease were different when they were compared for the two years. This variation parallels field experience with the disease. This might suggest that different conditions or agents, or both, may be responsible for the disease syndrome called "shipping fever." There seems to be no good reason to believe that one particular "stressor" or infectious agent alone is responsible. A number of quite different physical stressors have been shown[7] to be nonspecific since they cause similar physiological reactions called the general adaptation syndrome. On the same basis, several different viral agents might also be nonspecific in that a similar clinical syndrome might develop after infection with any one of them.

Since the sulfonamides and antibiotics are effective in treatment of shipping fever, bacteria must be responsible for most of the signs of illness. Differing bacterial floras may well determine the clinical characteristics of the disease and explain the variations observed in different outbreaks. However, these therapeutic agents do not seem to have prophylactic value when used before or immediately after shipment.[5] The trial in 1955 suggested that treatment at an opportune time tended to prevent the occurrence of elevated temperatures. The significance of these high temperatures was, however, not established since most of them were transitory and appeared without other signs of the disease.

While the calves studied during the fall of 1956 were in good condition when purchased, the 2 calves examined postmortem had lesions indicating respiratory infection before shipment. Therefore, the lower incidence of shipping fever in the 1956 experimental calves could have been related to immunity from previous infection.

SUMMARY

Two groups of calves in each of two years were studied following shipment from western ranches to feedlots. Daily temperatures were taken for ten days after arrival. During this period, percentages of 70.8, 80.7, 24.1, and 58.0 of the calves in the different groups had temperatures above 104 F. A characteristic neutropenia associated with the high temperatures was found during the first year, but was not so evident the second year. The elevated temperatures were usually transitory and often appeared without other signs of disease. Clinical cases of shipping fever did develop in a number of the calves and were treated when severe.

Experimental transmission of shipping fever was not accomplished when dairy calves were inoculated with blood and nasal exudates obtained from calves that developed high temperatures shortly after shipment from ranches to feedlots. The etiology of shipping fever is discussed.

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Notes on Animal Agriculture.—Livestock and livestock products account for 54 per cent of farmers' cash receipts from marketing. The produce from 70 per cent of harvested crop acres is marketed in the form of animal products. Livestock condense about 7 lb. of dry plant material, including grain, to about 1 lb. of dry matter as meat, milk, or eggs. Our population (over 170 million) has increased 29 per cent since 1940, and in 1956 the average person ate more red meat (167 lb.) than at any time since records began in 1899. People still want more meat, milk, and eggs than they are getting.—*True D. Morse in U.S.D.A. (June 7, 1957).*

Brucellosis in British Children.—Although brucellosis is relatively rare in Britain, 10 of 2,000 hospitalized children were found to be infected. All had lived in or visited in the country where they had consumed unpasteurized milk. The agglutination and skin tests were sometimes negative while the disease was active. Eradication of the disease in cattle and compulsory pasteurization of milk were recommended. Treatment with chlortetracycline and streptomycin seemed successful but relapses occurred.—*Brit Med. J. (March 16, 1957): 617.*

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D. O. NOORLANDER, B.S.

Davis, California

The physical forces employed in mechanical milking, when uncontrolled, are capable of injuring mammary gland tissue and, thereby, of preparing the way for the development of mastitis.[1]

When milk is flowing freely and partially filling the internal chamber of the teat cup, the vacuum on the teat is less than the maximum permitted by the vacuum controller, and the force with which the liner collapses against the teat is reduced proportionately. On the other hand, when no milk is in the teat cup, the vacuum on the teat reaches its maximum level and extends into the cavity of the teat. The vacuum on the interior of the teat causes the teat to shrink and more tissue is drawn into the teat cup to fill the space left by the shrunken teat. This is called crawling of the teat cup. Under these conditions, the delicate inner-lining tissues are forcefully rubbed together with each collapse of the rubber liner. The pressure of the liner against the teat is in direct proportion to the diameter of the liner and the magnitude of the vacuum in the internal chamber of the teat cup.

The purpose of the rubber liner is to provide massage to keep blood circulating through the teat. However, with many liners currently in use, the rubber strikes the teat with such force that a pinching effect rather than massage is produced. To lessen this pinching effect, the rubber liner should be of small diameter (¾ in.) and under tension. A further control of the force with which the liner compresses the teat can be obtained by incorporating in the claw a means whereby the vacuum on the teat is reduced to 5 inches at the moment the liner begins to collapse.

It is of prime importance in mastitis control to remove each teat cup as soon as milk flow stops. To do this effectively, it is important to employ visual milking at the level of each teat cup and to provide a

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[1]Pier, A. C., Schalm, O. W., and Hage, T. J.: A Radiographic Study of the Effects of Mechanical Milking and Machine Vacuum on the Teat Structures of the Bovine Mammary Gland, J.A.V.M.A., 129, (1956): 347-351.

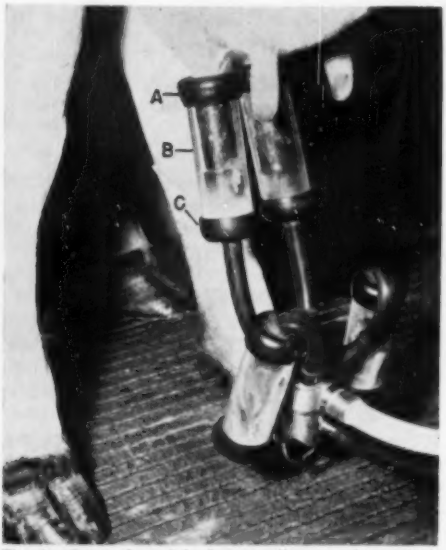

Fig. 1—Original model of new milking machine which provides for visual milking in each teat cup and reduction of vacuum on the teat with each pulsation. Front cups have been removed and attached to hooks while milking of rear quarters is being completed.

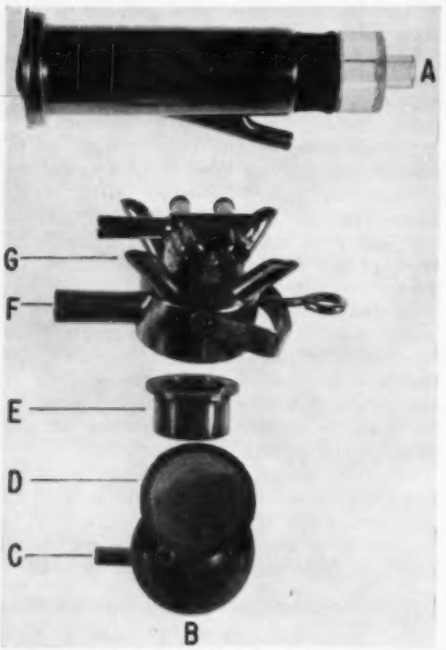

Fig. 2—Present stage of development of a proposed new design for milking machine claw and teat cup.

means whereby each teat cup can be removed individually without reducing the effectiveness of milking by the remaining cups.

Experimental milking machines which provide both visual milking and vacuum reduction with each pulsation have been developed in our laboratory. In the first model produced (fig. 1), a standard 09 liner (A) and sani-cap (C) were used in conjunction with a clear plastic cylinder (B) to construct a teat cup. The 09 liner was inserted into the plastic cylinder and the lower end of the liner was folded back to give a double thickness of rubber over the tip of the teat. This unit was unique in that a collapsing rubber liner was not employed. A vacuum alternating between 15 inches and 3 inches was applied directly to the teat end. To accomplish this, a claw with two chambers separated by a rubber diaphragm was designed. The diaphragm was activated by the pulsator; consequently, when air was directed into the lower chamber, the diaphragm was pushed upward against a cylinder inserted into the upper chamber and this momentarily interrupted the continuity between the milk hose and the teat cups. At the same moment, a controlled amount of air was permitted to enter the upper chamber to aid in rapid reduction of vacuum in the teat cups. This air was available to push the milk into the milk hose as the diaphragm dropped to re-establish vacuum in the teat cups. This model was used for over two months on about 25 cows. It milked satisfactorily but, when applied to small teats, the unit had a tendency to fall off at the end of milking unless supported by a string over the cow's back.

At the present stage of development of the new milking machine (fig. 2), a standard 03 teat cup with stretched rubber liner is used and visual milking is provided for by replacing the sani-cap with a plastic plug (fig. 2, A). The claw consists of a lower chamber (B) which connects with the pulsator hose at (C); when air is directed by the pulsator into the lower chamber, the diaphragm (D) pushes against the cylinder insert (E) to interrupt the flow of vacuum from the milk hose (F) to the internal chamber of the teat cup through (G). This interruption in flow of vacuum in the claw occurs simultaneously with collapse of the rubber teat cup liner. Thus, the liner collapses against a lower vacuum

than that employed in the milking phase and, as a result, a gentle massage rather than severe compression of the teat is obtained.

Large-scale field trials should be made to determine the merits of incorporating the features discussed here in the standard milking machine.

A New All-Breed Butterfat Record.—A purebred Brown Swiss cow, 11 years old, completed a 365-day test in April, 1957, in which she produced a record 1,544.75 lb. of butterfat on a three-time daily milking schedule. She produced 31,166.6 lb. of milk which tested 4.9 per cent butterfat. During August, 1956, she produced 3,128.9 lb. of milk with 111.9 lb. on her best day. On the last day, she milked 75.2 lb.—*Brown Swiss Bull. (June, 1957): 11.*

A registered Ayrshire cow, top lifetime producer of the breed, at 20 years of age, recently completed what may be a world's record for her age—13,122 lb. of milk, testing 4.8 per cent (630 lb.) of fat, produced in 305 days. She had produced 15 living calves and 103 tons of milk, estimated to have been worth $8,000.—*Ayrshire Digest (May 15, 1957): 258.*

The average milk production per cow in the United States increased about 20 per cent in the past nine years, from 5,000 to 6,000 lb., and may reach 7,000 lb. by mid-1960, according to the U.S.D.A.—*Successful Farm. (June, 1957): 13.*

A Landrace "Century Sow."—A purebred Landrace sow which has raised 103 of 135 pigs farrowed in nine litters, in Iowa, is the second sow to receive the Landrace "Century Sow" award. She is from a litter of 15 farrowed in July, 1952, and her first litter was born in March, 1953. Her largest litter was 21 in January, 1956.—*Nat. Hog Farmer (April, 1957): 23.*

Q Fever in Birds.—In an area in Czechoslovakia where Q fever was epizootic, 572 domestic birds (hens, turkeys, ducks, geese, and pigeons) were positive to the complement-fixation test. *Rickettsia burneti* was found in the feces of 1 hen from seven to 40 days after inoculation. Complement-fixation tests revealed infection in 36 of 480 wild birds in the vicinity of infected farms. *Rickettsia burneti* was isolated from the spleen and liver of 2 birds and from ectoparasites of swallows.—*Bull. WHO, 15, p. 329; abstr. in Vet. Bull. (May, 1957): Item 1458.*

Latent Infections

This term indicates the persistence of a virus or Rickettsia in the tissues for long periods, usually with no sign of disease. Bacteria and even larger parasites can also persist in the tissues for long periods. Many latent viruses have been discovered when, during blind passages of tissue suspension from one animal to another, one of them sickens and the filterable agent recovered will then reproduce disease in other animals of the same species.

Psittacosis virus persists as a latent infection in a variety of birds and may be shed in the excreta during times of stress, particularly at nesting time. This infects the young birds, some of which die, while others develop latent infections to continue the cycle. Many of the latent viruses in the lungs belong to the psittacosis group. The most common example of a latent virus in man is the virus of herpes simplex which causes vesicular eruptions (cold sores) during times of stress. Because of the tissue tolerance for the virus, antibodies against them probably never develop. However, with Rickettsia or the psittacosis group of viruses, antibodies are developed. While multiplication of these viruses within the cells usually seems to cause no damage, a sudden acceleration of virus production can cause cell damage and illness.—*Brit. Med. J. (April 27, 1957): 963.*

Pigeons as Psittacosis Carriers.—Of 112 clinically healthy pigeons, captured in Hamburg, Germany, 11 were carriers of psittacosis virus. Of 95 pigeons from other parts of Germany, 30 were carriers. When inoculated intraperitoneally into mice, the virus isolated was less pathogenic than that from psittacine birds.—*Vet. Bull. (May, 1957): Item 1456.*

Female houseflies can be prevented from laying eggs by certain chemicals (fluorocarbons) which come in contact with their legs. The result is forced retention of the eggs which are otherwise normal.—*Sci. (May 10, 1957): 938.*

A Comparison of Blood and Whey Brucellosis Tests on 20,000 Cows

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THIS IS A detailed report on the survey conducted in California, since 1954, to compare the efficiency of the blood and whey tests in diagnosing brucellosis in lactating dairy cattle. A preliminary report dealing with 2,500 cows and a progress report on 5,062 led to the conclusion that the whey test, using brucellosis ring test (BRT) antigen, could be safely substituted for the blood test in lactating cows.[1,2] Subsequent reports dealt with the interpretation of whey titers and the duration of whey reactions following adult vaccination.[3,4] The present report deals with data accumulated from 20,000 cows and permits analyses that, because of lack of numbers, were not possible in previous reports. These pertain to the relative incidence of blood and whey reactions in vaccinated and nonvaccinated animals, and to the relationship of these reactions to infection of the mammary gland.

METHODS AND MATERIALS

Blood and milk samples were obtained simultaneously. The latter consisted of approximately 10 ml. of a composite sample from all four quarters. Whey was obtained by adding 2 drops of rennin to the milk and incubating for an hour at 37 C. Tests were conducted either at the University of California, Davis, or in the mobile laboratories of the U.S.D.A. Most of the blood testing was by the plate technique, using serum antigen furnished by the U.S.D.A. Whey was tested by the plate technique using BRT antigen. Using serum antigen, it has been shown that there is no relationship between the whey reaction and infection of the mammary gland; many animals shedding Brucella in the milk were negative to the whey test.[5] We have compared serum plate antigen with BRT antigen and have concluded that serum antigen is in too high a concentration of cells and, therefore, not sensitive enough to detect agglutinins in whey. The test also was not sensitive enough for the tube technique to be adapted to whey.

In performing the whey test, 0.04, 0.02, and 0.01 ml. of whey was used with a standard drop (0.03 ml.) of BRT antigen. Tests were read in ten minutes and reactions were designated as 2, 3, or 4 representing 0.04, 0.02, and 0.01 ml. of whey. The number 1 designation was reserved for 0.08 ml. of whey which was used in some of the earlier tests, and which may be again used if necessary in further research. Routinely, in testing a herd the milk sample from each cow was first tested with 0.04 ml. of whey. Samples showing a reaction were retested with 0.02 and 0.01 ml.

When the survey was expanded by the addition of mobile laboratories and personnel, vaccination data were obtained on all animals. From these data, animals were classified as: (1) calfhood vaccinated, (2) adult vaccinated, and (3) nonvaccinated or those without an accurate history of vaccination. Only animals in which the official tattoo was apparent were designated as calfhood vaccinated. The adult vaccination classification was based either on an official tattoo or on the owner's individual cow record. In California, as a temporary measure, cows could be officially vaccinated if negative to the blood test not more than ten days prior to vaccination. Before that measure went into effect, many cows in the southern part of the state were vaccinated when added to the herd. The nonvaccinated group actually, therefore, consisted of many animals, vaccinated unofficially as adults, on which no records were kept; also, some that had been calfhood vaccinated but in which the official tattoo was not visible.

Whey titers in this report were interpreted as follows: whey 2 = suspicious; whey 3 and 4 = positive. Work in progress here and in other areas may result in a modification of this interpretation. The interpretation of blood titers was in accordance with the recommendations of the U. S. Livestock Sanitary Association, and approved by the U.S.D.A., and was the same for those vaccinated as adults and as calves. Shedders were determined by inoculating milk from reactors to blood or whey tests into guinea pigs.

RESULTS

A summary of the entire survey, and the number and percentage of animals in each of the various combinations of blood and whey reactions, is shown (table 1). Because of the small number of whey-suspicious reactions, these have been included as negatives. By combining blood- and whey-negative reactions with blood- and whey-positive reactions, we find a 91.1 per cent agreement between the two tests. The major discrepancy lies in the groups which are positive or suspicious to the

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The author thanks the personnel of the U.S.D.A. and the California Division of Animal Industry for their assistance in this survey.

TABLE 1—A Comparison of Blood and Whey Reactions from 20,000 Cows

Blood	Whey	Number	Per cent
−	−	17,762	87.1
+	+	813	4.0
+	−	523	2.6
s	−	1,168	5.7
s	+	67	0.3
−	+	67	0.3
		20,400 (269 herds)	100.0

Percentage agreement is 91.1.

Interpretation of blood reactions as recommended in official methods. Adult vaccinated interpreted as calfhood vaccinated animals. −=negative; +=positive; s=suspicious.

TABLE 2—The Relationship of Blood and Whey Titers to a Shedder Condition

Blood	Whey	No. inoc.	Shedders	Per cent
+	+	195	157	80.5
+	−	92	3	3.2
−	+	43	4	9.3
s	+	74	27	36.4
s	−	244	4	1.6
s	s	11	0	0
−	s	11	0	0
+	s	15	4	26.6
		685	199	

Blood pos. = complete at 1:200.

TABLE 2A—Number of Shedders in Blood Reactor Cows as Compared with Whey Reactors (Compiled from Above Table)

Reactions	No. inoc.	Shedders	Per cent
Blood + or s	631	195	31.0
Whey + or s	349	192	63.1
Blood −	54	4	7.4
Whey −	336	7	2.0

blood test, yet negative to the whey test. This can be accounted for by the fact that the survey contained many animals that had been vaccinated as adults. Also, in the area surveyed, calfhood vaccination was permitted up to 12 months of age. This could account for a number of blood-suspicious, whey-negative animals which are not infected but are carrying post-vaccination titers. A lack of good vaccination history may be responsible for some discrepancies.

The Relationship of Whey Titers to Infection in the Udder.—The number and percentage of cows which shed Brucella, as related to various combinations of blood and whey reactions, is shown (table 2). The vaccination history on some animals in this series was lacking, but it was known that at least 50 per cent had been calfhood vaccinated (up to 12 months of age). Therefore, blood titers complete at 1:200 were considered positive, and incomplete reactions at 1:100 or at 1:200 were regarded as suspicious. The data were also analyzed, using a complete reaction at 1:100 as blood-positive but, apart from a switch in numbers from suspicious to positive, there was no significant change in the over-all results. A comparison of the incidence of shedders in blood reactions and whey reactions is shown (table 2a). This table, designed to show the incidence of shedders in blood-reactor cows as compared with the incidence in whey reactors, indicates that only 31.0 per cent of the blood-positive or -suspicious cows were shedders, while 63.1 per cent of whey-positive or -suspicious cows were shedding Brucella. The comparison between blood- and whey-negative cows revealed shedders in 4 of 54 blood-negative, compared with 7 of 336 whey-negative, cows. These data were taken from comparative blood and whey tests on 6,500 cows from herds that, with few exceptions, were infected.

Comparative Blood and Whey Reactions in Two Separate Geographic Areas.—For the purpose of comparing blood and whey reactions, herds were allotted to two groups on the basis of brucellosis control practices. Group 1 consisted of herds from an area where herds were large (av. 115), the turnover in cattle great, and where adult vaccination was generally practiced. Group 2 herds were from an area where

TABLE 3—A Summary of Blood and Whey Test Comparisons in Groups 1 and 2

		Blood-negative		Blood-suspicious		Blood-positive		Total	
		(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)
Group 1	Whey −	5,727	99.5*	398	86.1	227	39.5	6,352	93.5
	Whey s	19	0.3	40	8.7	18	3.1	77	1.1
	Whey +	11	0.2	24	5.2	329	57.3	364	5.4
	Totals	5,757	(84.7)†	462	(6.8)	574	(8.4)	6,793	—
Group 2	Whey −	4,775	99.4	140	89.7	36	19.1	4,951	96.2
	Whey s	11	0.2	3	1.9	10	5.3	24	0.5
	Whey +	17	0.4	13	8.3	142	75.5	172	3.3
	Totals	4,803	(93.3)	156	(3.0)	188	(3.7)	5,147	—

*Percentage of total in column. †Percentage of total in group.

herds were smaller (av. 65), with a smaller turnover, and where relatively little adult vaccination was practiced. A summary of comparative blood and whey reactions in each group is shown (table 3). Of interest is the remarkable agreement between blood- and whey-negative cows in both groups. In blood-negative cows, the number of whey-suspicious and -positive reactions was insignificant. When 2 of the 11 blood-negative, whey-positive animals were retested, 12 days later, both were blood-positive.

On the other hand, we do not find the same agreement between blood-positive and whey-positive cows. The discrepancy again can be attributed to postvaccination reactions. A comparison of the numbers of whey-suspicious with blood-suspicious reactions in each group indicates that the incidence of the former is low and, therefore, much less of a problem in an eradication program than the blood-suspicious animal.

Comparative Blood and Whey Reactions in Calfhood, Adult, and Nonvaccinated Animals.—Here again, the herds were in two groups, similar to those in table 3, but they were further divided into calfhood-, adult-, and nonvaccinated cows. In group 2 herds, only a few adult-vaccinated animals were available and, therefore, have been omitted. The nonvaccinated could probably be better classified as animals without definite history of vaccination, although many had probably been either calfhood or adult vaccinated, or both. The number and percentage of animals in the various combinations of blood and whey reactions is shown (table 4). Note the low incidence of infection in the calfhood-vaccinated as compared with the nonvaccinated cows. Of particular interest is the insignificant number of whey-positive cows that are blood-negative or blood-suspicious as compared with the highly significant number of blood-positive or -suspicious animals that are whey-negative, especially in the adult vaccinated cows in group 1. Attention is called to the percentage agreement between the blood and whey tests—89.4 in group 1 and 95.7 in group 2. The difference in these figures can again be attributed to adult vaccination; in group 1 adult-vaccinated animals, there were 26.3 per cent blood-positive or -suspicious animals that were negative to the whey test.

In a previous report,[3] blood and whey tests were conducted on 19 BRT-negative herds comprising a total of 1,353 animals. The only whey reactions encountered were one positive and one suspicious. Work now

TABLE 4—A Comparison of Blood and Whey Reactions in Calfhood-Vaccinated, Nonvaccinated, and Adult-Vaccinated Cows

		GROUP 1 HERDS							
		CV*		NV†		AV‡		Total	
Reactions		(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)
Blood	Whey								
−	−	3,398	89.6"	2,030	79.9	318	69.1	5,746	84.6
+	+	37	0.9	274	10.8	18	3.9	329	4.8
+	−	117	3.1	62	2.4	65	14.1	244	3.6
s	−	227	6.6	155	6.1	56	12.2	438	6.4
s	+	11	0.3	12	0.5	2	0.4	25	0.4
−	+	3	0.1	7	0.3	1	0.2	11	0.2
Totals		3,793		2,540		460		6,793	
Percentage blood and whey agreement			90.5		90.7		73.0		89.4

		GROUP 2 HERDS					
		CV		NV		Total	
Reactions		(No.)	(%)	(No.)	(%)	(No.)	(%)
Blood	Whey						
−	−	3,751	95.4"	1,035	85.3	4,786	93.0
+	+	58	1.5	84	6.9	142	2.7
+	−	20	0.5	26	2.1	46	0.9
s	−	85	2.2	58	4.8	143	2.8
s	+	10	0.3	3	0.2	13	0.3
−	+	9	0.2	8	0.7	17	0.3
Totals		3,933		1,214		5,147	
Percentage blood and whey agreement			96.8		92.2		95.7

*CV=calfhood vaccinated;
†NV=non vaccinated, or of unknown status; ‡AV=adult vaccinated; "percentage of total in column.
Because of the insignificant number of whey-suspicious samples, they are included as whey-negative.

in progress indicates that the removal of whey reactors from BRT-positive or -suspicious herds resulted in these herds becoming BRT negative.

DISCUSSION

In this survey, the whey test has been compared with three accepted methods employed for the diagnosis of brucellosis of dairy cattle: (1) the blood test, (2) the brucellosis ring test, and (3) bacteriological examination of milk when blood and whey reactions were not in agreement. The results indicate conclusively that agglutinins are present in the whey of animals carrying virulent infection, and that these agglutinins can be detected if a suitable antigen is employed. By all criteria, the whey test is equally as effective as the blood test in the diagnosis of brucellosis of dairy cattle.

Because of the extensive amount of vaccination and revaccination at all ages that had been conducted in California, the interpretation of blood titers would not always conform to the official recommendations. This was inevitable and should not be construed as weakness in the investigation; the error would be corrected in dealing with 20,000 animals. A number of animals may be classified as negative when they perhaps should have been suspicious; also, some may be suspicious when they should have been positive. In a population of this magnitude, it can be expected that an approximately equal number would be the other way and the discrepancy cancelled. In order to eliminate the possibility of experimental error through misinterpretation of blood titers, cross sections of the data were analyzed by (1) assuming that all animals had been calfhood vaccinated and (2) that none had been vaccinated. No significant difference was observed from the percentage agreement (table 1). The investigations are continuing and modifications in techniques and interpretations may appear desirable as the work progresses.

The test is more specific than the blood test, and postvaccination whey titers will not persist in noninfected animals. The false blood-positive or -suspicious reactions constitute a serious handicap in brucellosis eradication, comparable to the "no visible lesion reaction" encountered in tuberculosis eradication. In areas such as California, where adult vaccination has been practiced and where calfhood vaccination is permitted up to 12 months of age, the situation is accentuated. The whey test, because of its specificity, eliminates this problem. Using a whey tube test, postvaccination whey reactions were found to recede within three months,[6] a feature confirmed in the current investigations.[4] This accounts for the significant percentage of blood-positive or -suspicious animals that are whey-negative.

In tests on cattle from infected herds, vaccinated late in calfhood but uncomplicated by adult vaccination, there is remarkable agreement between blood and whey tests (96.8%) with the greatest discrepancy in the blood-suspicious but whey-negative classification. Because of the insignificant number of whey-negative cows that are shedding *Brucella abortus*, and the fact that all are in infected herds, the whey reaction can be considered a true indication of infection and the negative whey test as evidence of freedom from infection. Although whey-negative shedders are encountered in infected herds, the foregoing evidence indicates that blood-negative shedders occur at least as frequently in similar herds. Another significant advantage of the whey over the blood test is the insignificant number of suspicious reactions in the former. This fact was also demonstrated in comparative blood and whey tests in BRT-negative herds.[3]

Second in consideration is the physical advantage of the whey over the blood test. It is just as easy to conduct in the laboratory and is no more time-consuming than the blood test. Milk samples, unlike blood, will not readily spoil for serological testing during shipping. The greatest physical advantage, however, lies in the comparative ease of obtaining milk samples. This is of particular importance where herds are large, the turnover in cattle high, and where facilities for bleeding cattle frequently are inadequate or nonexistent. In California, the dairy cattle population is approximately 860,000 mature cows (70% of herds av. 125 cows). In the Los Angeles area, this average is considerably higher but the acreage per head smaller. The cows are housed only briefly for milking. Milking is usually done by stanchioning cows in relays or in walk-through milking barns, many of which have feed hoppers in front of the cows. Bleeding during the milking

operation is objectionable under these conditions, and running cows through a second time is a major operation that is costly in labor and milk production. In an eradication program, frequent testing is essential. Under California conditions, this can be accomplished only by using the whey instead of the blood test.

The adoption of the whey test would mean a marked acceleration of the eradication program in California. The industry has proved its willingness, during this survey, to follow-up the vaccination program, that has proved so successful, with extensive testing. If, however, eradication in California were obliged to depend on the blood test, the program would be set back many years.

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Vaccinal Brucella Found in Milk.—The milk of 85 cows was examined, in Poland, before, and daily for 14 days after, vaccination with *Brucella abortus* strain 19. The organism was isolated from the milk of 1 cow 24 and 48 hours after vaccination. —*Vet. Bull. (May, 1957): Item 1371.*

Fumagillin.—This antibiotic, elaborated by strains of *Aspergillus fumigatus,* is used clinically as an amebicide, especially against *Entamoeba histolytica.* Since it has no effect on fungi or bacteria, oral therapy is not complicated by overgrowth of Monilia or alterations in the flora in the gastrointestinal tract. It has no effect on the extraintestinal form of the disease. Side effects are frequent but seldom serious and are usually reversible. It is administered orally (in man), 10 mg. four times daily for ten to 14 days.—*J.Am.M.A. (May 11, 1957): 170.*

Mixtures of Antibiotics.—The Council on Drugs of the A.M.A. concludes that a combination of antibiotics is indicated only in a few highly selected conditions; that they have been used not only where they did no good but actually could be harmful; and that, when combined therapy is indicated, the antibiotics should be given separately except when applied locally to the skin.—*J.Am.M.A. (May 4, 1957): 44.*

A study at Ottawa (Canada) indicated a great discrepancy between the disintegrating time of drug tablets reported by the manufacturer and those found in the laboratory.—*J.Am.M.A. (April 20, 1957): 1551.*

Chloral Hydrate in Bovine Ketosis.—Propionates were found, in Sweden, to be not always effective against ketosis in cows, and cortisone and other hormones were expensive. Chloral hydrate was recommended not as a substitute but as a complementary measure in treating unresponsive cases.—*Vet. Bull., Item 547 (Feb., 1957): 86.*

Salt Sprinkled on Newborn Lambs Reduces Mortality.—When 320 pregnant ewes, in Peru, were allotted to two groups and a salt solution was sprinkled on the lambs of one group immediately after birth, the salt induced the ewes to lick their lambs dryer, thus lowering mortality from night frosts and reducing the number of disclaimed lambs, especially those of young ewes.—*L. Calle in La Voz del Vet. (March, 1957): 6.*

Hyperkeratosis in Draft Cattle.—Typical chronic hyperkeratosis (chlorinated naphthalene poisoning) occured in 7 draft cows during a six-year period on a small farm in Germany. A synthetic driving belt treated with chlorinated naphthalene had been used, some months before, as the back pad of the harness. Calves in the same stable and on the same feed remained well.—*H. Ohder in Monatsh. f. Vet.-med. (March 15, 1957): 131.*

Canine Rabies – England, 1791

Capt. CHARLES T. BUSH, V.C., U.S.A.F.

Munich, Germany

A TATTERED COPY of a sporting magazine* (fig. 1), printed in London in 1793, contains an interesting article written by a surgeon, Francis Hopkinson, entitled "Facts and Observations Relative to the Rabies Canina."

This article, written 90 years prior to Pasteur's work with rabies virus, begins as follows:

The following facts and observations are the consequences of the hydrophobia breaking out among Earl Fitzwilliam's hounds . . . On Wednesday, June 8, 1791, in the night, the man who sleeps at the kennel was unusually disturbed by the hounds fighting. He got up to quiet them several times and always found the same hounds quarrelling. After being disturbed three or four times in this manner by one particular hound, he was induced to suppose from an appearance of stupidity in him, and from his riotous behavior, that he was attacked with the hydrophobia. He accordingly led him out of the pack, and confined him in a place by himself, after which they rested quiet for the remainder of the night.

In the morning when the Huntsman came to the Kennel, he was told of what had passed, and the supposed mad hound shown to him. His appearance was suspicious. Some meat was given to him, part of which he ate, though he seemed to swallow it with some difficulty. Two days passed over in this state of doubt. At the end of the third day his disorder was confirmed. At the end of the fifth day he died mad.

The consequences of this was that immediate preparation was made for confining 42 couple of hounds separately until the month of September (84 days) which was rigidly adhered to. By this means I had an opportunity of observing the exact progress and symptoms of the disease. Six dogs have gone mad in the following order:

No 1 . . . Jul 1st (Probable incubation period 23 days)
No 2 . . . Aug 3rd (Probable incubation period 56 days)
No 3 . . . Sep 3rd (Probable incubation period 87 days)
No 4 . . . Sep 4th (Probable incubation period 88 days)
No 5 . . . Nov 10th (Probable incubation period 155 days)
No 6 . . . Dec 8th (Probable incubation period 183 days)

Though I observe above that they were confined separately till the month of September, I do not mean to say that they were all kennelled together after that time, but that they were taken from their chains in September and first exercised for about half ar hour together, not more than 4 or 5 couple at a time, and not trusted out of the sight of the attendants, and when their exercise was over confined again separately, and every one fed in different troughs. In the beginning of October they were taken out, ten couples at a time; at the latter end of that month, 20 couple, but still observing the same care and caution as to separate confinement, when they came in from exercise. In the beginning of November they were hunted, but chained up as usual after hunting, till the third week of that month when they were let loose in different apartments of 1, 2, 3, 4, and 5 couple together which was the case till the month of June 1792, the huntsman, (who had a great deal of experience in the disorder) not thinking them safe under a year.

There was no other remedy made use of but mercurial ointment. They all, except the bitches in whelp, went through two frictions, so as to produce in many a violent salivation.

Remarks from the above facts: From the above statements, we have an opportunity of seeing that the disorder seems as virulent as to the power of inoculation (I make use of the term inoculation because the manner in which the infection is communicated is always by that process) at the commencement, as in the advanced stage of it, as all the six dogs that went mad were probably infected June 8th within a few hours of each other, though at the same time I must remark that No. 5 was attacked with the disease when he was loose in the Kennel yard with the rest of the pack, but he was not seen out of sight of the attendants, he was immediately confined in consequence of his appearance being suspicious, and was not seen to bite No 6. There is every reason to believe that he was infected June 8th, though I do not mean to mention it is an absolute certainty.

It is a common opinion, that when a dog is bitten by one that is mad, that a few weeks confinement, sea bathing, or the popular nostrums, are either of them sufficient to secure him from infection, and will effectually prevent him from committing depredatings on the public, but here we have an opportunity of observing that there is no security in six months, perhaps not in twelve, that mercury has no power as a preventative, and that William Dean, Earl Fitzwilliam's huntsman, in his time, has repeatedly employed all the popular

Capt. Bush is base veterinarian, Neubiberg Air Base, Munich, Germany.

*"Sporting Magazine; or, Monthly Calendar Of the Transactions of the Turf, the Chace, and every other Diversion Interesting to the Man of Pleasure and Enterprize," found in a book stall, Cheltenham, Gloucestershire, England.

remedies without having any effect whatever, he having had an opportunity of observing nearly the same progress in several different packs of hounds, where no expense was spared for every medicine in use, sea bathing, etc, except with this remarkable difference, that in this last instance, no medicine was given, and he never had fewer hounds attacked with the disease; the result therefore of William Dean's experience in the Preventive plan is a long and separate confinement, for whenever he has depended upon medicine and not upon the above treatment the disorder has made dreadful havoc.†

There is every reason to suppose that the hound that first went mad was not bitten by any other

†England today (1957) is a rabies-free country. All dogs entering the United Kingdom are quarantined in special kennels for six months.

Sporting Magazine.
INSCRIBED to the NOBLEMEN and GENTLEMEN of the JOCKEY CLUB
Number VII.
(To be continued Monthly), Price ONE SHILLING,
Richly embellished with a beautiful and ſtriking Reſemblance of that famous Deer called MOONSHINE, in the poſſeſſion of his Majeſty; and an exact Repreſentation of the Oatland Stakes, as run over at Ascot, on Tueſday, the 18th of June, 1793.
OF THE
SPORTING MAGAZINE;
Or, MONTHLY CALENDAR
Of the TRANSACTIONS of the TURF, the CHACE, and every other Diverſion Intereſting to the Man of Pleaſure and Enterprize.
INCLUDING
RACING
HUNTING
COURSING
SHOOTING
HAWKING
COCKING
FOWLING
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DRAUGHTS
PEDESTRIAN EXERCISES
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CHESS
BILLIARDS, &c.
&c. &c.
Together with ſuch other Occurrences as ſeem entitled to the Attention of the SPORTING GENTLEMEN.
BY A SOCIETY OF SPORTSMEN.
LONDON: PRINTED FOR THE PROPRIETORS,
And Sold by J. WHEBLE, No. 18, Warwick-ſquare, near St. Paul's; William Burrell, at Newmarket; and by every Bookſeller and Stationer in Great Britain and Ireland.

Fig. 1—The cover of a copy of a sporting magazine printed in London in 1793.

dog, but that it was in him a spontaneous disease.**

The whole pack were examined very attentively, and bites found upon four couple, one of which was found fighting with the mad hound twice. These underwent a stricter and longer confinement than the rest. However none of them were attacked with the disease, and it is worthy of remark that no bites were found upon the six hounds, that went mad; the infection taking place or not, is therefore probably the result of chance, and though no bites were found upon the hounds which went mad, there is every reason to suppose there were bites, but that they were small, and concealed by the hair.

Symptoms of the Disease in Dogs: The common symptoms of the attack of Hydrophobia is, in general, a loathing of food, though this does not always take place, as they will sometimes eat solid food, but not liquid. The first and only symptom No. 3 had of the attack of the disorder, was eating his own excrement when food stood by him, the feeder knowing this was an act the dog would not do if he were well, immediately confined him in the apartment alloted for the mad dogs. He remained in doubt for a day or two; however his suspicions proved right, for he died raving mad on the fifth day.

At the commencement of the disorder, the mad dog has a particular tendency (if loose) to lick and smell the penis and fundament of another dog: this should always be looked upon as a very suspicious symptom. William Dean speaks of this sign as almost a never failing one.

There seem to be intervals of sense for the first two or three days and during the time they in general acknowledge their master, their eyes look clear and well, the tongues moist and of the proper color, but if a dog is loose at this time, he will in general bite everything he meets with. He will sometimes, during this stage of the disease, leave his home for several hours, commit depredations upon men and beasts, and return home again. The mad dog seldom survives the fifth day from the first attack; if he is suffered to run about, I have reason to believe it hastens his end a day or two. At the end of the third or fourth day, his appearance is much altered, his eyes are sunk, his tongue black and dry, he makes dreadful howlings and seems much disturbed; indeed the last stage of the disease is dreadful to witness. In the first stage of the Rabies Canina, it is difficult for a person not conversant with the disposition of dogs in general, and of the mad dog in particular, to ascertain whether the dog is mad or not; even William Dean himself was in doubt for a day or two, respecting the dog that was first attacked with the disease; however, in the last stage of it no one can be mistaken.

It is a common received opinion, that mad dogs will not take the water; in this neighborhood, in the summer of the year 1791, we had two instances of mad dogs when closely pursued, swimming a large navigable river. It may be doubted whether they were mad or not; however it is certain they were so, as two hogs went mad from the bite of one, and the other was pursued by William Dean for many miles, who was not likely to be mistaken; and that they swam the river is certain.

From all that has been hitherto practiced and written on the hydrophobia, it seems that we know of no cure when the disease has taken place; that our preventatives are very doubtful indeed; that in the human species, an early and proper attention to the wound is the only thing to be depended upon, and that the degree of danger is to be estimated from the extent and depth of the wound. A large and deep wound affording a greater cause of absorption than a small one, and such wound being more out of the reach of washing, caustics, excision, etc. That in dogs, a long continued and separate confinement is the only thing to be relied upon, for whoever depends upon the popular nostrums, or in fact upon any medicine, and not upon the above treatment, will I am fearful, have great cause to lament their credulity respecting the power of medicine in this dreadful disease. I am, gentlemen, your obediant servant. Francis Hopkinson, Surgeon, Peterborough, England, March 1793.

**In 1860, or 67 years after the writing of this article, Pasteur, supporting the views of Cagniard-Latour and Theodore Schwann, disapproved the theory of spontaneous generation.

SUMMARY

An article written in a sporting magazine published in England in 1793 describes an outbreak of canine rabies in a pack of 84 hunting hounds. Written some 90 years before Pasteur started work on the rabies virus, the author, an English surgeon, claimed the following procedure was effective in dealing with rabies: (1) early attention to cleansing the wound; and (2) strict and long (12 months) quarantine of suspects.

Leaving dog bites of the human face to heal by secondary intention is condemned, as is the use of fuming nitric acid to cauterize such wounds. They are no more subject to pyogenic infection than other facial wounds.—*Med. Times (May, 1957): 574.*

Effect of Cortisone on Rabies in the Mouse.—When cortisone was given with antirabies serum to mice experimentally infected with rabies, it had an unfavorable effect.—*Ann. Inst. Pasteur (Feb., 1957): 287.*

Local Therapy for Periodic Ophthalmia.—Suspensions of penicillin, or of penicillin and dihydrostreptomycin (30,000-50,000

units), injected into the anterior chamber of the eye, were rapidly absorbed and the resulting corneal opacity disappeared in three days. Local treatment was supported by intramuscular injections of the same antibiotics. The result of treatment of 43 horses with periodic ophthalmia was satisfactory, with only occasional recurrence during an observation period lasting six to 12 months after treatment.—*Vet. Bull. (May, 1957): Item 1530.*

Caprine *Leptospira Pomona* Infection

Three bucks, 6 to 8 months of age, and 1 doe 2 years of age were infected with *Leptospira pomona* following subcutaneous inoculation of 5 cc. of guinea pig blood. Another buck goat, approximately 4 months of age, was infected during 30 days of pen contact with 3 *L. pomona*-infected hogs.

Characteristic clinical manifestations of leptospirosis, *i.e.* depression, anorexia, fever, and hemoglobinuria, were not evident. Erythrocyte and hemoglobin levels and total and differential leukocyte counts remained within normal limits.

Leptospiremia was not demonstrable seven to 13 days following inoculation. Leptospiras were isolated from the kidneys and urine of the 4 bucks at 14 to 31 days. Leptospiras were present in the liver or spleen of the animal which was housed with the infected hogs, but not in the urine, kidneys, liver, and spleen of the doe.

The agglutination-lysis serum titers for *L. pomona* had attained a level of 1:100 million by the thirteenth day, for all animals.

The most significant gross pathological alterations were confined to the kidneys. The cortical surfaces contained one to six small grayish white foci which measured approximately 1 mm. in diameter. The lesions extended through the depth of the cortex and into the medulla. Renal lesions, upon microscopic examination, were characterized by accumulations of lymphocytes, plasma cells, and mononuclear phagocytes.

None of the goats showed recognizable central nervous system disturbances. However, the brains of 4 animals contained microscopic lesions. Perivascular cuffing was observed in the cerebrum, cerebellum, meninges, hippocampus, and medulla. Similar alterations have been observed in the brains of experimentally infected sheep. The lesions closely resemble those observed in listeriosis.

Goats may contract leptospirosis following contact with infected cattle (*J.A.V.M.A., 128,* (1956): 408-413) and swine. Large numbers of leptospiras are shed in the urine of the infected goat. Therefore, the goat represents a potential source of *L. pomona* infection for susceptible hosts. In areas where the goat population is high, this species should be considered as a possible reservoir of *L. pomona* infection.—[*E. V. Morse and R. F. Langham: Experimental Leptospirosis. III. Caprine Leptospira Pomona Infection. Am.J.Vet.Res., 18, (Oct., 1957): In press.*]

Leptospirosis in Horses.—A high percentage of horses in Hungary have leptospirosis without showing clinical signs. The source is usually infected pigs and cattle (*L. pomona*). In a study of naturally and experimentally infected horses, illness was manifested by low or high fever for two to six days, weakness, loss of appetite, and conjunctivitis. Some horses developed hematuria (albuminuria) or icterus. At the end of the fever period, 2 horses showed acute panophthalmitis and laminitis, and another had dermatitis. Leptospira were isolated from the urine of 6 sick horses (5 *L. pomona*, 1 *L. sejroe-hebdomadis*).—*G. Hirt, L. Kaza, and F. Kemenes in Magyar allator. Lap. (Feb., 1957): 2.*

Antileptospiral Effect of Milk.—It has been reported, from Australia, that Leptospira died rapidly in milk from cows, goats, and human beings. This antileptospiral agent in cow's milk may explain the absence of milk-borne infection where bovine leptospirosis is enzootic. The effect on the organisms is quite different from that of lytic antibodies in human and rabbit immune serums.—*J.Am.M.A. (May 18, 1957): 320.*

Serotypes of Leptospira, new in the United States, have recently been isolated from opossums (*Leptospira mitis-hyos*) and from raccoons (*Leptospira australis*). —*Pub. Health Rep. (May, 1957): 431.*

Smog-breathing mice may have 2.5 times as many lung cancers as those breathing "washed" laboratory air.—*Sci. News Letter (May 25, 1957): 325.*

External Fixation of a Comminuted Mandibular Fracture in a Dog

RODERICK SNOW, D.V.M.

Reseda, California

In recent years, external fixation of mandibular fractures has become a relatively common procedure in small animal practice. The following case is reported only because of the somewhat unusual problems encountered in reduction, fixation, and postoperative management.

A Malemute-type dog, 5 years old, was kicked in the jaw by a horse Dec. 30, 1956. There was abnormal lateral movement of the lower jaw and considerable swelling and edema on the left side. Radiographs revealed a comminuted fracture below the left molar and premolar teeth (fig. 1). The comminuted fragments were located distally to the main transverse fracture line, which was ventral to the last molar tooth. There were four or five small fragments and a large one which contained three molar and two premolar teeth. The lowermost small fragments were located at least 0.5 cm. above the ventral border of the horizontal ramus, which was intact except at the main transverse fracture line. The oral mucosa was intact and good apposition of the fragments was maintained by the soft tissues. Whether blood and nerve supplies to the teeth were disrupted was uncertain.

The dog was anesthetized with pentobarbital sodium, and the fracture was repaired, using Kirschner splint equipment. The first and second pins were inserted about 1 cm. from the posterior edge of the vertical portion of the ramus, the lower pin being just above a line through the alveolar border of the mandible. The third and fourth pins were inserted into the horizontal portion of the ramus about 1 cm. above its ventral edge, with care being taken to avoid the inferior alveolar artery and nerve, and at a safe distance from the fracture line. With the pins firmly embedded, pin bars were clamped into place

Fig. 1—Radiograph showing comminuted fracture of the dog's lower jaw (arrows).

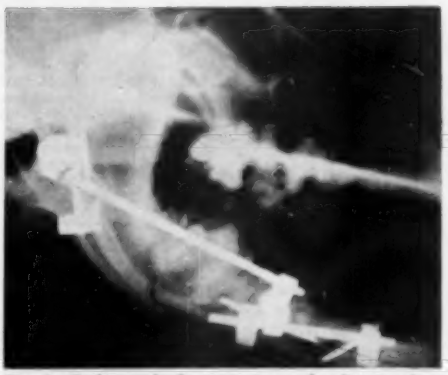


Fig. 2—Radiograph showing pins and splint in place in the dog's jaw.

Dr. Snow is a small animal practitioner in Reseda, Calif.

Fig. 3—Photograph of the dog showing pins and splint in place.

and the connecting bar inserted loosely into the double clamps.

When satisfactory reduction was obtained, through intraoral and external manipulation, the double clamps on the connecting bar were tightened (fig. 2). Reduction and occlusion were satisfactory (fig. 3) with the exception of the large, tooth-containing fragment, which was still freely movable. It was secured with two heavy sutures inserted with a curved needle, going downward along the medial surface of the bone through the floor of the mouth, coming out through the skin under the mandible, and back through the skin and along the lateral surface of the bone and over the alveolar border where the sutures were tied. One was placed in front of the last premolar tooth, the other behind the first molar.

Close observation was maintained during recovery from anesthesia so that the patient would not dislodge the splint, and the animal was kept in the hospital for six weeks. Antibiotics were given daily for three days. The temperature remained normal. A high protein, semisolid diet, supplemented with dicalcium phosphate and vitamin D, was given.

The Kirschner splint and sutures were removed after six weeks. Since the sutures had cut through the skin and mucosa and were completely buried, an incision was made over each knot to remove them.

Good union of the fracture was obtained with only moderate thickening of the mandible. The large, tooth-containing fragment and all of the teeth were firm. Occlusion and mastication appeared to be normal. The owner was cautioned not to allow the dog to chew on hard objects for at least six months. When examined four months later, occlusion and mastication seemed normal and there was no evidence of the jaw having been fractured.

Increasing Fertility of Ewes.—A single subcutaneous injection of 500 I.U. of serum gonadotrophin (pregnant mare serum), given on day 12 or 13 of the estrus cycle of ewes, will be of benefit in a flock where the normal fertility is poor but not in a flock where half or more of the ewes normally have twins or triplets. Estrus is indicated by the use of sterile rams. After treatment, the ewes are turned in with fertile rams. In one flock, the number of lambs born per ewe was 1.26 for controls, 2.07 for injected ewes; the number of living lambs at 2 weeks of age was 1.0 for controls, 1.47 for injected ewes.

If a crop of lambs is desired earlier than usual, the ewes must first be sensitized by five injections of progesterone in oil (20 mg.) on alternate days, followed in 48 hours with 800 units of PMS. (To produce sterile "teaser" rams, it is suggested that the testicles be gently repelled into the abdomen and an elastrator ring applied to the neck of the scrotum which will then slough.)—*Vet. Rec. (May 25, 1957): 537.*

Atresia Ani in Lambs.—Seven lambs of the fat-tailed breed, in Indonesia, all but 1 sired by 1 ram and his son, were born with imperforate ani. Necropsy showed a rudimentary rectum in 2. After surgery, 1 male and 2 females recovered. A third female defecated through a rectovaginal passage.—*Hemera Zoa (Feb., 1957): 98.*

[Atresia ani is occasionally seen in pigs, some of which live until at least 5 weeks of age without relief. Since only 1 case is usually seen in a herd, a hereditary factor has seldom been considered. However, in one litter, all the gilts had a rectovaginal opening and defecated through the vulva. When examined they were thrifty and several months old, and the owner could recall nothing peculiar about the males in the litter.—W.A.A.]

Cesarotomy was performed successfully through the right flank of a lioness which had been in difficult parturition for eight days.—*Med. Wtryn. (April, 1957): 225.*

Nodular Splenitis in Swine Associated with Brucellosis

WAYNE A. ANDERSON, D.V.M., M.S., and C. L. DAVIS, D.V.M.

Denver, Colorado

IN THE ROUTINE inspection of slaughtered swine, carcasses are occasionally seen with multiple, discrete, encapsulated nodules in the spleen, and with no other macroscopic lesions. The veterinary inspector, faced with the necessity of an immediate decision, usually diagnoses the condition as brucellosis, tuberculosis, or parasitic lesions. However, because of the unusual location of the nodular lesions, a number of spleens have been retained for laboratory examination. This is a report on 18 such spleens submitted to the Animal Disease Research Laboratory at Denver. The postmortem, bacteriological, and pathological findings have been so uniform that this condition is now regarded as a distinct pathological entity, justifying at least a presumptive diagnosis of brucellosis. However, the finding of nodular splenitis does not confirm Brucella infection in swine, nor does the absence of this lesion indicate that the animal is free from the disease. The evidence presented is intended to show one of the ways brucellosis in swine may be manifested grossly, and to serve as an aid in the differential diagnosis of similar cases at necropsy.

MATERIALS AND METHODS

A series of 18 borax-preserved hog spleens were received at the laboratory in the course of the routine diagnosis of meat-inspection specimens. Each contained multiple, small, spherical, encapsulated nodules filled with dry caseous debris. Accompanying each was a report by the examining veterinarian, giving the postmortem findings and, with one exception, the presumptive diagnosis.

Stained smears were prepared from the expressed contents of selected nodules from each specimen and examined for the presence of acid-fast bacilli. Portions of each spleen, including lesions, were fixed in 10 per cent formalin. Histological sections of each portion were stained by three methods: Ziehl-Neelsen, hematoxylin-eosin, and Giemsa. Typical nodules and some of the adjacent tissue were removed aseptically from each spleen, ground in a sterile mortar, and sus-

TABLE I—Postmortem and Laboratory Findings in 18 Cases of Multiple Nodular Splenitis in Swine

Case (No.)	Sex	Est. age (mo.)	Other lesions observed	Postmortem diagnosis	Bacteriological findings	Laboratory diagnosis
D-294	F	10	None	Parasitism	Brucella*	Brucellosis
D-594	F	12	Portal lymph node, enlarged	Brucellosis	—†	Probable brucellosis
D-1244	F	24	None	Tuberculosis	—	Probable brucellosis
D-1285	—	7	None	Parasitism	—	Probable brucellosis
D-1610	F	30	None	Brucellosis	Brucella*	Brucellosis
D-1624	F	36	None	Tuberculosis	Brucella*	Brucellosis
D-1626	M	8	None	Brucellosis or tuberculosis	Brucella suis	Brucellosis
D-1629	F	24	None	Tuberculosis	—	Probable brucellosis
D-1635	F	36	No report	Tuberculosis	—	Probable brucellosis
D-1650	F	24	None	Brucellosis	—	Probable brucellosis
D-1875	M	7	None	Brucellosis	—	Probable brucellosis
D-2045	F	6	No report	Tuberculosis	Brucella suis	Brucellosis
D-2105	F	24	None	Parasitism	Brucella suis	Brucellosis
D-2845	M	8	None	Tuberculosis	Brucella*	Brucellosis
D-3301	F	6	No report	Brucellosis	Brucella suis	Brucellosis
D-3382	M	6	None	Brucellosis or tuberculosis	—	Probable brucellosis
D-3577	F	12	None	No diagnosis	Brucella suis	Brucellosis
D-3600	F	7	None	Brucellosis	Brucella suis	Brucellosis

*Species of Brucella not determined. †Negative bacteriological findings.

From the Animal Disease Research Laboratory, Animal Disease and Parasite Research Division, Agricultural Research Service, U. S. Department of Agriculture, Denver, Colo. Dr. Davis is now retired.

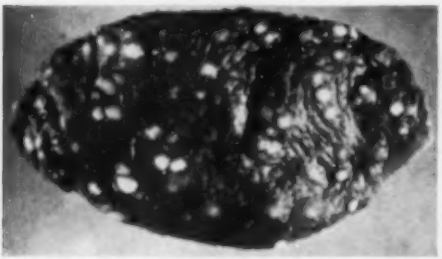


Fig. 1—Spleen (from pig D-3301) showing brucellosis lesions. The multiple, encapsulated nodules were both subcapsular and deep within the parenchyma.

pended in bacto-tryptose broth. Bacto-tryptose plates were streaked with each suspension and incubated under aerobic conditions at 37 C. Two guinea pigs were inoculated with 0.5 cc. of each suspension, which had been filtered through cotton; 1 was injected intraperitoneally, the other subcutaneously in the right flank. Unless death occurred sooner, they were held for at least six weeks, killed, and examined for evidence of brucellosis. One guinea pig inoculated with splenic tissue from pig D-3600 was held for 120 days. Diagnosis was based on the finding of postmortem

Fig. 3—Normal spleen from a guinea pig (left) and spleen and testicle (from guinea pig, case D-2045) showing brucellosis lesions (right). The infected spleen is enlarged and contains a single abscess; the testicle contains a small abscess.

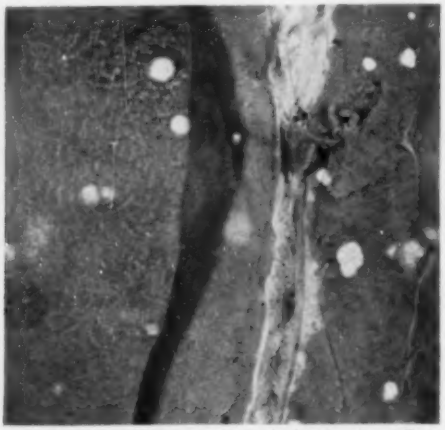


Fig. 2—Spleen (from pig D-312) showing brucellosis lesions. Notice the nodules on the surface (left) and on a cut section deep within the parenchyma (right).

lesions, positive agglutination titers, and the recovery of the causative organism. The identification of Brucella was made on the basis of morphology, staining characteristics, and agglutinating ability when tested against known positive and negative serums. Classification according to species was made on the basis of dye tolerance, H_2S production, and urease activity.

RESULTS

Bacteriological Findings.—In none of the 18 spleens were acid-fast bacilli demonstrated in direct smears or in tissue sections.

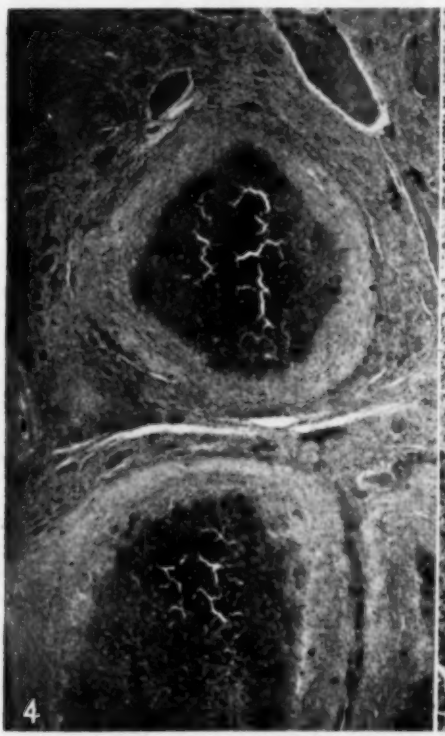
Brucella organisms were isolated from 10 of the 18 guinea pigs that had been inoculated with splenic tissue suspensions (table 1). Of the 6 classified according to species, all were *Brucella suis*.

Pathological Changes.—The number of nodules per spleen varied from five to many (fig. 1). The diameters of the lesions seldom exceeded 4 mm., and most were smaller. Inspectors described the lesions as shotlike, pinhead, and grain-of-wheat size. The color of the caseous centers was yellow to grayish white, with sometimes a slight greenish tinge. Frequently, evidence of calcification could be detected. Many of the nodules were subcapsular and readily visible; others were located deeply (fig. 2). They could be readily expressed or peeled out, and there was no involvement of the surrounding splenic tissue.

In addition to the similarity in the lesions, a distinguishing feature of this con-

dition is that in none of the 18 swine were similar abscess-like nodules reported elsewhere in the carcass. This has been such a constant finding that, in swine, we have come to regard nodular splenitis, in the absence of other lesions, as strongly suggestive of brucellosis. Of 18 postmortem reports submitted, 14 specifically stated that no other lesions were evident, three made no reference to this point, and one reported an enlarged portal lymph node, but it was not available for laboratory examination. There were six postmortem diagnoses of brucellosis, six of tuberculosis, three of parasitism, two of brucellosis or tuberculosis, and in one there was no diagnosis.

Microscopically, the nodules appeared as encapsulated, spherical masses of coagulation necrosis containing disintegrating inflammatory cells and nuclear debris (fig. 4, 5). There was usually a variable amount of mineral salt deposit. The caseous centers were surrounded by a narrow zone of reactive cells which included epithelioid cells, small round cells, and a few neutrophils. A noticeable number of eosinophils was consistently found. Giant cells were occasionally found, but their scarcity served to distinguish the lesion from a tuberculous process. The well-developed, connective tissue capsule varied in thickness in different nodules. There was no extension of the inflammatory process into the surrounding parenchyma, although some distortion and pressure atrophy of the immediately adjacent tissue was usually evident. Sections from nodules which did not yield Brucella, by guinea pig inoculation, showed essentially the same histological picture as those from bacteriologically positive spleens (fig. 6).



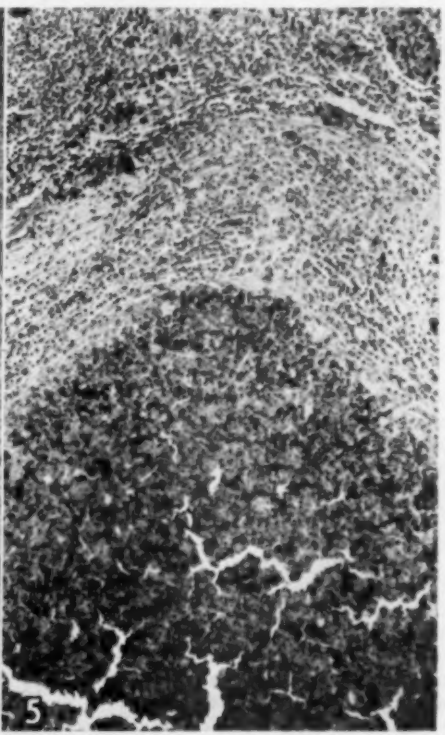


Fig. 4—Swine spleen (case D-3600) showing brucellosis lesions. The encapsulated nodules containing partially calcified caseous centers is characteristic. H & E stain; x 30.

Fig. 5—Portion of encapsulated nodule, from swine spleen with brucellosis lesions (case D-3600), showing infiltration of inflammatory cells of the chronic type around the edge of the necrotic area and in the capsule. H & E stain; x 95.

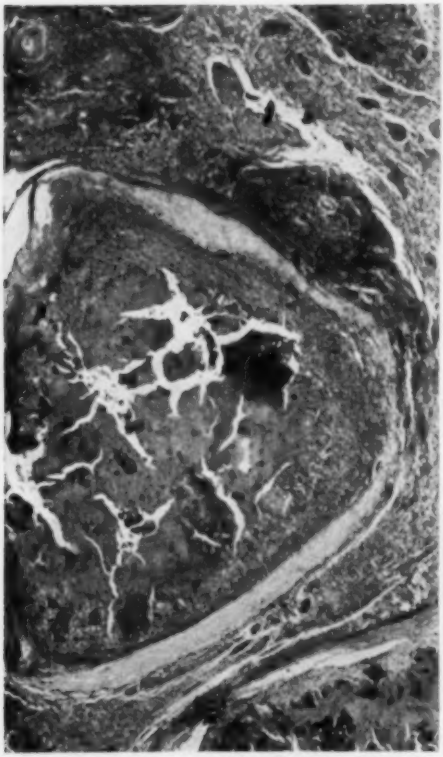


Fig. 6—Swine spleen, probably infected with Brucella, (case D-1635) showing a heavily calcified necrotic mass surrounded by a zone of reactive cells and a well-defined capsule. H & E stain; x 30.

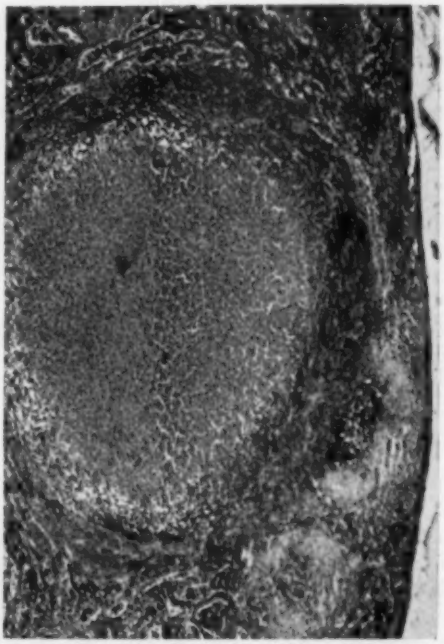


Fig. 7—Encapsulated caseous nodule, characteristic Brucella lesion, in spleen of guinea pig (case D-3600) killed 120 days after inoculation. Note the similarity in appearance to swine spleen lesions shown in figure 4. H & E stain; x 30.

DISCUSSION

The diagnosis of "probable brucellosis," made in the 8 cases which were bacteriologically negative, must be justified if the histopathological picture here described is to be considered an aid in the gross differentiation of granulomatous conditions observed in porcine spleens at the abattoir.

Failure to demonstrate Brucella in all the spleens was probably to be expected. In a study of 24 cases of spondylitis in swine,[1] Brucella was isolated from only ten vertebral lesions but, despite this low rate of recovery, the disease was considered a definite pathological entity in the vertebrae of swine. The explanation that the semidry content of an encapsulated abscess did not provide a suitable environment for the survival of the causative organism is reasonable and is applicable in this study. In the eight spleens from which Brucella organisms were not recovered, no other etiological agent was demonstrated and the gross and microscopic pathological findings so resembled those of the positive cases that a diagnosis of probable brucellosis was considered justifiable.

Tuberculosis and parasitic lesions are most frequently confused with those of nodular Brucella splenitis in swine. This confusion is understandable when based only on the postmortem picture. Even in the laboratory, a definite causative agent can not always be demonstrated.

There is justification for considering a postmortem diagnosis of tuberculosis, for encapsulated, nodular, tuberculous lesions do occur in the spleens of swine. However, the discrete nodules (fig. 1, 2) do not greatly resemble the nonencapsulated, tumefied, dimpled splenic lesions which are frequently associated with the avian type of tuberculosis. A splenic lesion of bovine tuberculosis in the hog which is quite in-

distinguishable histologically from the Brucella nodule has been described[2] (fig. 4). The lesions produced in swine by the bovine tubercle bacillus were considered distinguishable from those caused by the avian form of the organism by their discrete, circumscribed, nodular character.[2] We have seen similar nodular tuberculous lesions of the spleen in swine but never without lesions elsewhere in the carcass. It is important, therefore, that the possibility of tuberculosis be eliminated in the diagnosis of nodular splenitis in swine. In this study, we were not able to demonstrate acid-fast bacilli either in smears or in tissue sections, nor did any of the inoculated guinea pigs develop primary or generalized lesions of tuberculosis. Furthermore, primary tuberculosis of the spleen without lesions elsewhere in the carcass would be an unusual occurrence.

The postmortem diagnosis of parasitism, made three times in this series, was probably justified in that the lesions are not unlike what might be expected as a reaction to disintegrating parasitic larvae. However, although the spleen may occasionally be invaded by migrating larvae, it is unlikely that lesions would be found in the spleen alone and not in more common locations, such as the liver. Moreover, in none of the sections studied were recognizable remnants of disintegrating parasites observed. A slight to moderate eosinophilic infiltration was a constant finding (a similar observation was made in a study of avian tuberculosis lesions in swine[2]), and it is our opinion that the infiltration of eosinophils is a common response in granulomatous reactions in this animal and is not necessarily an indication of parasitism.

The diagnosis of pathological conditions in meat inspection is based, for the most part, on the gross postmortem findings. Because of the time element and the limited facilities available, the relative number of specimens which can be submitted to the laboratory for diagnosis is small. Thus, one of the important functions of a meat-inspection diagnostic laboratory is its educational value in providing a means for the veterinary inspector to correlate his observations with a laboratory diagnosis. Also, the accumulated case records of the diagnostic laboratory serve as a background for evaluating the significance of specific lesions or groups of lesions which may be encountered. This report is submitted as an aid in the gross differentiation of nodular Brucella splenitis in swine from other granulomatous conditions.

SUMMARY

Eighteen cases of nodular splenitis in swine are described, 10 of which yielded Brucella organisms.

In all instances, the postmortem and histopathological findings are comparable.

It is suggested that, in the absence of other lesions, the finding of a focal, nodular splenitis in swine justifies a presumptive diagnosis of brucellosis.

Acid-fast baccilli were not demonstrated in direct smears or tissue sections of these spleens, and none of the guinea pigs injected with splenic material developed tuberculosis.

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Hygromycin B Anthelmintic for Swine.—A new antibiotic, "hygromycin B," given in feed (5 lb./ton), is reported, from the University of Wisconsin, to be effective for the control of whipworms, lungworms, nodular worms, and ascarids, as well as Strongyloides and possibly stomach worms in pigs. It apparently affects the reproductive cycle by destroying the parasite eggs. It has no toxic effect and can be fed to pigs as soon as they start creep-feeding. The parasite egg fertility drops from 98 per cent to 0 within two weeks. —*Agric. Leaders' Digest (June, 1957): 12.*

Chloramphenicol for Foot Rot.—When the lesions on cattle with foot rot were painted with chloramphenicol, improvement was remarkable, especially when retreated in a week.—*Gac. vet. (Argentina) (Oct., 1956): 223.*

Botulism in Sheep and a Dog.—Clostridium botulinum, type C, was isolated, for the first time in France, from sheep with botulism and also from the liver of a paralyzed dog. The origin of the organism was not determined.—*Bull. Acad. vét. France (Oct., 1956): 421.*

A Preliminary Report on the Effects of Iron-Dextran, Injected Intramuscularly, on the Growth Rate of Newborn Pigs

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Recent reports[4,6,7] from England have shown that iron-dextran has advantages over other parenterally administered iron compounds, such as saccharated iron oxide[5,8,10,12] and elemental iron,[13] in preventing and alleviating anemias of pregnant women and of infants. Similar advantages have been observed in newborn pigs with iron-dextran given intramuscularly as compared with ferric phosphate[1,3] and saccharated iron oxide.[11] Iron pyrophosphate also has been administered orally in atempting to prevent anemia of pigs.[2]

The intramuscular injection of 2 ml. of iron-dextran, supplying 100 mg. of iron, into pigs 4 days old, was found sufficient to maintain normal hemoglobin and hematocrit readings for at least three weeks.[9] No harmful effects from the intramuscular injections were noticed.

Experimental Procedure

An experiment under field conditions was designed to determine the growth rate of newborn pigs injected with iron-dextran (Armidexan)* as compared with control pigs. The pigs were weighed at 4 days of age and at 2, 4, 6, and 8 weeks. Iron-dextran (2 ml.) containing 100 mg. of iron was injected intramuscularly into 27 pigs at 4 days of age, and 26 pigs were left untreated as controls. The pigs had access to soil throughout the nursing period. They were not creep-fed; however, the pigs began to eat the commercial ration fed to the lactating sows at approximately 2 weeks of age.

Results and Discussion

The weight differences between the two groups of pigs showed a progressive increase with age (table 1).

Statistical analysis (t-test) of the data from the pigs at 2 weeks of age showed that the difference of 0.7 lb. was significant at the 14 per cent level. At 4 weeks of age, the difference of 1.8 lb. was significant at the 1 per cent level. The difference of 1.8 lb. was significant at the 5 per cent level. At 8 weeks of age the 3.1 lb. difference between control and treated pigs was signficant at the 8 per cent level. With these data, it is possible to estimate the number of pigs necessary for significance at the 5 and 1 per cent levels. Provided the difference between groups remained constant at 8 weeks, 30 pigs per group would be necessary at the 5 per cent level of significance and 55 pigs per group at the 1 per cent level.

It is apparent from this investigation that 100 mg. of iron injected intramuscularly into pigs less than a week old will stimulate the growth rate as well as maintain normal hemoglobin and hematocrit values.[9] In 1947, it was reported[16] that the oral administration of ferrous sulfate at the rate of 5 mg. of iron per pound of body weight per day for three weeks increased the growth rate of pigs. The greater rate of growth by the treated pigs over the control group was believed due to the increased consumption of milk.

It should be kept in mind that the pigs receiving iron-dextran in this experiment were raised on dirt floors and were not fed a supplementary ration fortified with essential nutrients during the nursing period. It appears that growth and hematological responses obtained with intra-

TABLE 1—Average Weights and Standard Deviations of Pigs Injected Intramuscularly with 2 ml. of Iron-Dextran, and of Control Pigs

	Age in weeks									
	4 days		2		4		6		8	
	C	T	C	T	C	T	C	T	C	T
No. of pigs†	27	26	27	26	26	25	25	25	25	25
Mean wt. (lb.)	4.2±1.1	4.3±1.0	7.8±1.8	8.5±1.9	11.8±2.2	13.6±2.6	20.2±4.3	22.9±4.9	26.2±5.7	29.3±6.3
Difference in wt. (lb.)		0.1		0.7		1.8**		2.7*		3.1

C = control; T = treated; *significant at 5 per cent level; **significant at 1 per cent level; † 2 control pigs and 1 treated pig died during the experiment. The owner disposed of these pigs without necropsies being performed.

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Approved for Publication by Colorado State University.
*Supplied by the Armour Laboratories, Chicago, Ill.

muscular injections of iron-dextran into pigs will be governed by (1) the ration fed to sows during pregnancy,[14] (2) the nutritional status of the creep ration fed during the nursing period,[15] and (3) whether the pigs have access to soil during the nursing period.[15]

SUMMARY

Pigs less than 1 week old, injected intramuscularly with 100 mg. of iron in the form of iron-dextran, were approximately 3 lb. heavier at weaning time (8 wk.) than untreated controls.

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Myoclonia Congenita (Trembles) in Pigs

Trembling in pigs has been reported at intervals since 1922 in at least six countries and on three continents. Hereditary factors have been suspected but seldom indicated. In the past three years, in Sweden, 11 pigs, 7 affected and 4 normal, have been subjected to histological examination of the central nervous system and the only pathological change observed was an incomplete development of the myelin sheath in the majority of the affected pigs. Investigation in one herd indicated that the condition may have been due to incorrect feeding of the sows during gestation. There is no basis for believing that there is a hereditary or a virus infection factor. It is emphasized that the condition appears where no hog cholera or cholera vaccination occurs.—*E. Christensen and N. O. Christensen in Nord. Vet.-med. (Dec., 1956): 1921.*

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A litter of 11 Yorkshire pigs born May 14, 1955, showed signs of "trembles" when 3 days old. Their temperatures were normal but all showed an accelerated pulse and respirations. Blood tests showed the calcium, phosphorus, and sugar content to be normal. On necropsy of 1 pig, no growths or histopathological changes were found. Six weeks later, the remaining pigs seemed normal except for stiffness of the hindlegs. A litter of pigs born a year later to the same sow and boar showed mild signs of trembles which could easily have been unnoticed.—*D. C. Maplesden and G. C. T. Brown in Canad. J. Comp. Med. (May, 1957): 170.*

Enterotoxemia (Edema Disease) in Pigs.—Pigs weaned when about 2 weeks old, in Britain, developed edema disease a week later and several died. Necropsy findings on 6 included: fine fibrin shreds on the viscera in several, facial edema in 1, perirenal edema in 2, and congested lymph nodes in most. Hemolytic *Bacterium coli* were recovered in almost pure culture from the intestines of 2 pigs. The intesti-

nal contents were pooled, later centrifuged, and the supernatant fluid stored for use. Four pigs (35 to 50 lb.) were each given 14 to 15 cc. of this fluid intravenously. All died with lesions and other typical signs in 17 to 72 hours. *Bacterium coli* was *not* recovered from their organs.

Extract of the intestinal contents of 1 of these pigs, when injected intravenously into another pig, produced no ill effects; thus serial transmission failed. Attempts to induce active or passive immunity also failed. Bacteria-free extract of the intestinal contents of affected pigs killed mice when injected intravenously, and none was protected by the serum. These findings are compatible with the enterotoxemia theory and field evidence indicates that edema disease is related to the hemolytic *B. coli*. —*M. Gitter and M. K. Lloyd in Brit. Vet. J. (May, 1957:) 212.*

Hemolytic Disease in Newborn Pigs.—When 40 litters (350 pigs) affected with hemolytic disease were studied, often continuously from birth until death or recovery, in Britain, none were seen where the sow was known to be unvaccinated with crystal violet hog cholera vaccine and many had been vaccinated twice. However, this condition is reported in litters of nonvaccinated sows in Hungary.

This disease can result in the hypoglycemic collapse syndrome and thus confuse the diagnosis. There are three significant diagnostic signs: (1) a yellow to red wine (free hemoglobin) discoloration of the unpigmented skin, or pallor in peracute cases; (2) hemoglobinuria, from an intensified yellow to cider color in milder cases but reddish in most fatal cases; and (3) the auto-agglutination of the blood cells. On necropsy, a blood-stained peritoneal fluid and splenomegaly may be present, and the stomach is usually well filled with normally coagulated milk. The combination of icterus and hemolysis can produce colors varying from an orange to a bronze tint in the tissues, often most marked on the coiled intestine. A simple but reliable test for this disease consists of placing a few drops of blood on a glass slide which is gently rocked to prevent auto-agglutination of the erythrocytes in large clumps, then allowed to dry. Discrete clumping of the erythrocytes is diagnostic. —*R. F. W. Goodwin in Vet. Rec. (May 11, 1957): 505.*

Diagnosing Hog Cholera by Encephalitis.—The pathological changes of the central nervous system should be of interest in the diagnosing of hog cholera since they seem responsible for consistent clinical signs of the disease. Some observers, in Germany, are of the opinion that both the clinical picture and the pathological changes in swine fever differ from those of 20 years ago and that animal-transmission tests are indispensable for accurate diagnosis. However, these tests are difficult and not necessarily conclusive.

The author believes that the main basis for the diagnosis will always be based on the clinical, pathological, and histological findings considered with the epidemiology and history. Bacteriological tests are necessary for differential diagnosis. The intelligent evaluation of the pathological changes and the clinical examination, when possible, of several sick animals can almost always lead to a correct diagnosis. Evaluation of lesions must be qualitative, not quantitative; thus a few isolated petechiae in pale kidneys are of great significance.

A study of the literature refutes the theory that the disease has changed. Even in 1925, a latent form of the disease, which was hard to diagnose, was reported in young pigs. An important lesion which often assumes a typical form is a nonpurulent encephalomyelitis which, in diagnostic value, can be compared with the kidney lesions. Histological examination of the central nervous system should be used more.—*J. Beer in Monatsh. f. Vet.-med., 11, (1956): 14.*

Bovine Ringworm Therapy.—A new antifungal compound [hexadecamethylene-I:16-bis (isoquinolinium chloride), 0.25%], in an alcoholic lotion colored with crystal violet, has been used on over 100 cattle with ringworm, in Britain. The alcohol insures penetration, the color insures total coverage. The lesions are first scraped or scrubbed with water (soaps and detergents are contraindicated) to remove crusts and scabs, then dried and the lotion applied with a stiff brush or a cotton swab. Two to three applications at intervals of three to four days usually is effective. No toxic effect has been observed.—*J. Forster in Vet. Rec. (May 18,1957): 519.*

Iodinated Organic Compounds as Radiographic Contrast Mediums in Canine Practice

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AIR, BARIUM, and iodinated organic compounds are used as radiographic contrast mediums to outline the hollow organs of the body. The purpose of this paper is to describe some of the uses of iodinated organic compounds as aids in radiographic diagnosis.

MATERIALS AND METHODS

The organic iodide compounds used in contrast radiography are available in two forms, as aqueous or oily solutions. These compounds contain 25 to 70 per cent iodine.

Three possible methods of administration of the solutions are: (1) The iodized oil or aqueous solutions can be introduced directly into body cavities which communicate with the surface, such as the bronchial tree, salivary glands, nasal cavities, or fistulous tracts. (2) The aqueous solutions can be injected intravenously and radiographs made as they are selectively concentrated by a specific organ; for example, diatrizoate (Hypaque) in the kidney and iodipamide (Cholografin) in the bile ducts and gallbladder. (3) Aqueous solutions may also be injected directly into a vessel and radiographs made while the vessels are outlined by the solution.

Small test vials of aqueous solutions of the organic iodides are supplied with each package for sensitivity tests. Unfavorable reactions to any of these solutions are rare in the dog, except when large doses of concentrated solutions are given. Epinephrine (Adrenalin) is preferred to counteract unfavorable reactions to these solutions; antihistamines have not proved effective.

Although the cost of some iodinated organic compounds needed for an examination may be several times that of the film, they are an economical diagnostic aid because they will reveal anatomical variations that would not otherwise be visible.

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TABLE I—Products Used as Contrast Mediums for Canine Radiographic Diagnosis

Examination	Drug	Approximate iodine content of solution (%)	Type solution
Angiocardiography and arteriography	Iodopyracet (Diodrast 70%)[1]	36.0	Aqueous
	Sodium acetrizoate (Urokon 70%)[2]	44.0	Aqueous
Arthrogram	Iodopyracet 35%	18.0	Aqueous
	Chloriodized oil (Iodochloral)[3]	27.0	Oily
Bronchography	Chloriodized oil	27.0	Oily
	Propyliodone (Dionosil)[4]	30.0	Oily
	Propyliodone	30.0	Aqueous
	Iodized poppy seed oil (Lipiodol)[5]	28.0 or 40.0	Oily
Cholocystogram (intravenous)	Iodipamide (Cholografin)[6]	25.7	Aqueous
Draining sinuses and fistulas	Chloriodized oil	27.0	Oily
	Iodized poppy seed oil	28.0 or 40.0	Oily
	Iophendylate (Pantopaque)[7]	30.5	Oily
	Propyliodone	30.0	Oily
Mammography	Iodized poppy seed oil	28.0 or 40.0	Oily
	Iodopyracet 35%	18.0	Aqueous
	Chloriodized oil	27.0	Oily
Myelography	Iophendylate	30.5	Oily
	Iodized poppy seed oil	28.0 or 40.0	Oily
Paranasal sinuses	Chloriodized oil	27.0	Oily
	Iodized poppy seed oil	28.0 or 40.0	Oily
	Propyliodone aqueous	30.0	Oily
	Propyliodone oily	30.0	Aqueous
Salivary gland	Iodopyracet 35%	18.0	Aqueous
	Chloriodized oil	27.0	Oily
	Iophendylate	30.5	Oily
Urography (excretory)	Iodopyracet 35% and 70%	18.0 and 36.0	Aqueous
	Sodium acetrizoate 30% & 70%	21.0 and 44.0	Aqueous
	Diatrizoate (Hypaque 50%)[8]	30.0	Aqueous
	Sodium iodomethamate (Neo-Iopax 50% & 70%)[9]	25.0 and 37.0	Aqueous

[1]Winthrop-Stearn; [2]Mallinckrodt; [3]Searle; [4]Glaxo Lab.; [5]E. Fougera and Co.; [6]Squibb; [7]Lafayette Pharmacal; [8]Winthrop Lab.; [9]Schering

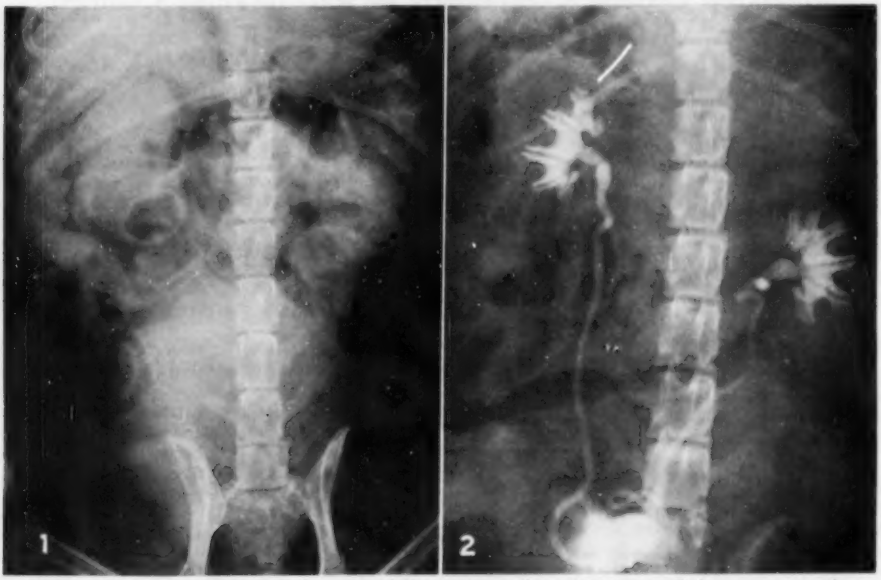

Fig. 1—An excretory urogram of a normal dog, using sodium Acetrizoate. Failure to empty the colon before conducting the examination makes this film difficult to interpret.

Fig. 2—Urogram of a normal dog, using diatrizoate.

A preinjection or "scout" film is routinely taken for later comparison with films taken when the contrast medium is used.

RESULTS

Urinary System.—The excretory urogram, the only suitable method for visualizing the pelvis and ureters of the canine kidney, has been successfully used for demonstrating abnormalities.[1,2]

Some products commonly used for excretory urography are listed (table 1). A folder indicating the technique of administration to man is furnished with each prod-

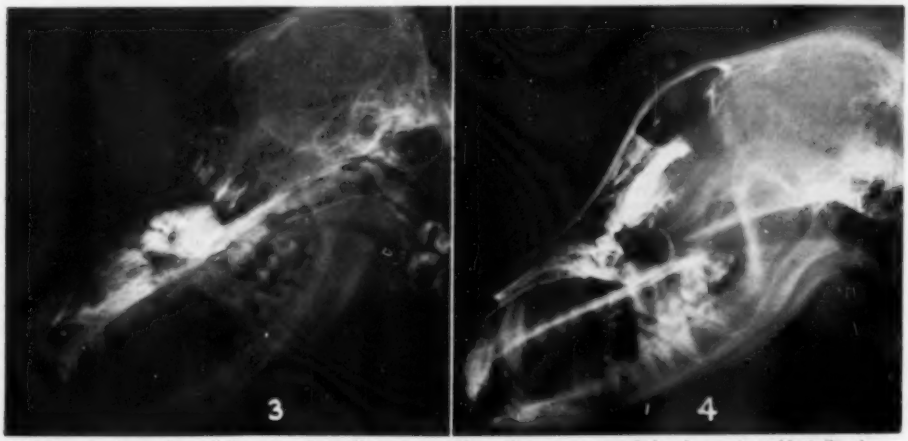

Fig. 3—An outline of the normal maxillary sinus and nasal passageway of the dog, using chloriodized oil.

Fig. 4—An attempt to outline the frontal sinus of the dog. Note that, although the sinus is not filled, enough medium has entered to define its limits.

uct. In general, when these materials are used in the dog, recommendations for their use in children should be followed. Emptying the intestinal tract, especially the colon, with enemas is important, as bowel content will obscure the urinary tract (fig. 1). Compression of the abdomen cephalad to the pelvis is necessary to occlude the ureters and retain the solution in the kidneys (fig. 2). The technique can be performed more satisfactorily with anesthesia, but may be done without it.[3]

Performance of this examination by retrograde injection is impractical, even in the female dog, because of the large size of existing cystoscopes. However, retrograde urography may be done experimentally by laparotomy and injecting the material directly into the ureter.

Respiratory System.—The iodinated organic compounds used for outlining the respiratory system are mainly oily suspensions; an exception is aqueous propyliodone (Dionosil). The facial sinuses may be outlined (fig. 3) by any of the oily iodinated organic compounds. The injection must be done with the dog under anesthesia. If several drops of 2 per cent butacaine sulfate (Butyn Sulfate) are instilled into the nasal cavity before introducing the catheter, the dose of general anesthetic can be reduced. After the dog is anesthetized, a small polyethylene catheter (1.5 mm.) is passed into the nasal cavity to the level of the maxillary sinus and the opaque medium is introduced (2 to 3 cc. in a small dog). The head is slowly rotated (about 1 minute in each position), first with the lateral side down, then with the nose up, and finally with the face down, so the oil will be evenly distributed, and radiographs are taken immediately.

The frontal sinus is difficult to fill completely with contrast medium by intranasal injection; however, if the dog is placed on its back and about 5 cc. of an aqueous solution is injected into the dorsoposterior portion of the nasal cavity, enough medium will enter the sinus to reveal its outline (fig. 4).

Respiratory System, Lower.—In bron-

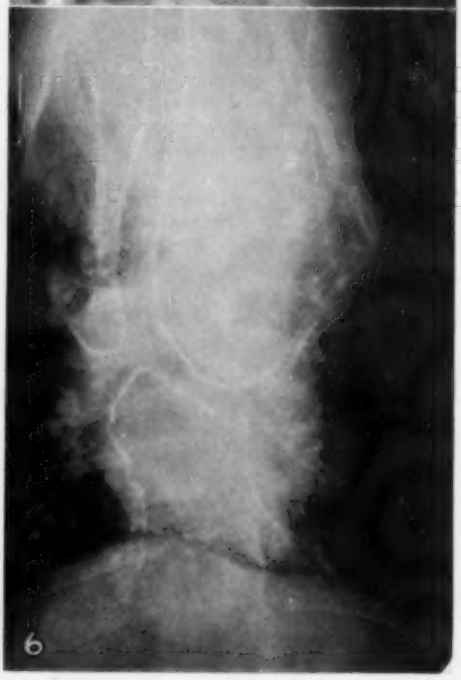

Fig. 5—A normal bronchogram using oily propyliodone.

Fig. 6—A bronchogram illustrating lateral deviation of the trachea due to a large mediastinal tumor. Oily propyliodone was used.

Fig. 7—An aortogram in a normal dog; 10 cc. of sodium acetriozoate solution was injected into the left ventricle.

chography, anesthesia is given, a tracheal catheter is introduced, and a polyethylene tube (about 1.5 mm. in diameter) is passed through the catheter to the level of the fourth rib. With the animal's head higher than the thorax, opaque medium is introduced; then the dog is held, for about one minute each, in dorsal recumbent and in left and right lateral recumbent positions and radiographs are taken immediately (fig. 5, 6). The usefulness of bronchography has already been demonstrated in veterinary literature.[4,5]

Vascular System.—Radiographs outlining vessels of the body can be obtained by injecting aqueous solutions of organic compounds. The opaque medium is injected into the lumen of the vessel and a radiograph taken simultaneously. Aortograms are accomplished by injecting an aqueous solution of an organic iodide into the left ventricle of the heart and obtaining a radiograph as the solution passes through the aorta (fig. 7). Abdominal aortograms obtained by lumbar puncture are not recommended, as the canine aorta is fragile and the needle hole will not close as it does in the human aorta. Angiocardiograms and other special examinations of the vascular

Fig. 8—A cholecystogram in a normal dog, using iodipamide. Note that the bile duct may also be distinguished.

bed of the dog are useful experimentally, but have had limited application in veterinary practice.

The Gallbladder.—Cholocystograms in the dog are most satisfactorily accomplished by intravenous injection[7] of a contrast medium which will be excreted in the bile to accumulate in the gallbladder. As in excretory urography, the intestinal tract should be emptied. When iodipamide is used,[8,9] the best films are usually obtainable at two to three hours after the injection (fig. 8).

Nervous System.—For myelograms, iophendylate (Pantopaque) is considered the safest contrast medium.[10-12] It is important to become proficient at injecting the contrast medium. To inject it through the cisterna magna, a puncture is made in the midline, posterior to the occiput and bisecting a transverse line drawn through the anterior edge of the lateral processes

Fig. 9—A myelogram using iophendylate to illustrate contrast medium forming around a blockage in the subarachnoid space. A tumor was present in this dog.

of the atlas. The needle is directed downward until the ligamentous tissue between the skull and the atlas is encountered. When this tissue is penetrated, a flow of spinal fluid will be obtained. The amount of opaque material injected is varied according to the size of the dog (av. 1.5 to 3.0 cc.). The flow of the radiopaque material down the subarachnoid space is observed by serial radiographs or by fluoroscopy. Variations in the flow and density of the oil are produced by any space-occupying lesion of the spinal cord, such as a herniated intervertebral disc or a spinal tumor (fig. 9).

Iophendylate occasionally irritates the meninges; also, contrast mediums are often impossible to remove from the dog's conus medullaris. However, if a laminectomy is considered necessary, a preoperative myelogram will give the exact location of the spinal lesion.

Miscellaneous.—Iodopyracet (Diodrast) and chloriodized oil (Iodochloral) are both suitable for outlining joint cavities. The iodinated organic compounds can be used where details of the extent of a joint capsule are in doubt (fig. 10). Since injection of these compounds may be painful, it is often necessary to use anesthesia. For obtaining contrasts of interosseous ligaments within joint cavities, air is the recommended contrast medium.

Fig. 10—An arthrogram in a normal joint using iodopyracet. The limits of the dog's femoropatellar joint capsule are illustrated.

Parotid salivary glands can be outlined by a retrograde injection of a radiographic contrast medium, either in oily or aqueous suspension, through the parotid salivary duct. If an aqueous solution is used, it is necessary to make the radiograph quickly, as the solution is rapidly absorbed (fig. 11).

Fig. 11—The canine parotid salivary gland outlined by 30 per cent iodopyracet injected into the parotid duct.

Fig. 12—Chloriodized oil injected into a fistulous tract in the femoral region of a dog. Note that the opaque material has accumulated around a radiolucent object (a piece of wood previously placed there).

A discharging sinus or fistula can be outlined by injecting one of the organic iodides suspended in oil[13] after the sinus has been flushed. A radiograph will then not only show an outline of the tract, but may reveal the presence of a foreign body (fig. 12).

The mammary gland of the larger domestic animals may be outlined by radiographic contrast mediums such as chloriodized oil or iodized poppy seed oil (Lipiodol). These glands should be as empty as possible before the medium is injected. Although an oily suspension is generally used for this purpose, the author has used an aqueous suspension (iodopyracet) successfully.

SUMMARY

The use of iodinated organic compounds as aids in radiographic diagnosis in the dog is described. These compounds are available in both aqueous solution and in oily suspension. They may be used by introducing them into body cavities which communicate with the surface, by injecting directly into body cavities, or by injecting a material which is selectively excreted by the liver or kidneys. They are useful in determining anatomical variations in the structure of many hollow organs or body cavities.

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Air Embolism from Pneumoperitoneum.—The most serious complication of pneumoperitoneum is air embolism. Cardiac, respiratory, and cerebral signs may appear simultaneously, the cerebral predominating. Of 5 cases of air embolism in 127 pneumoperitoneums in man, 3 were benign, 1 severe, and 1 fatal. The air embolisms occur when between 60 and 180 cc. of air have been injected. To avoid this complication, air is now injected at a rate of not more than 20 cc. per minute.—*J.Am.M.A. (May 11, 1957): 211.*

Effects of Feed Restriction

The belief that animals utilize feed more efficiently when growth is continuous and rapid is questioned. For four weeks, one group of rats was fed, ad libitum, a balanced ration fortified with all required vitamins; those in a second group were fed 70 per cent of this ration; and those in a third group were given the same casein, vitamins, and minerals as group 1, but only 70 per cent of the energy intake. On carcass analysis, rats in the first group averaged 31 per cent body fat, those in the other groups only 19 per cent. However, when feeding was continued until all had consumed the same total of energy foods, there was little difference in weight although rats in the restricted groups required 6 to 13 days longer to reach their goal. Those which had once been on total diet restriction showed more carcass fat (30%) than those in which only the energy foods had been restricted (25%). This indicated an advantage in carcass development when proteins, vitamins, and minerals were not restricted.

When six pairs of identical twin beef calves (av. 400 lb.) were similarly compared by restricting corn to 1 of each pair during the time they were 6 to 16 months of age, the liberally fed calves gained an average of 2.26 lb. daily; those fed 75 per cent as much corn, 1.0 lb. daily; those fed 62 per cent as much corn, 0.5 lb. daily; and those fed only 50 per cent as much corn made no gain. However, all reached 1,000 lb. on about the same amount of feed energy but the calves on the restricted ration required 10 to 20 weeks longer to reach that weight.

These results indicate either that energy expenditure was conserved during the growth retardation period, or that energy foods were used more efficiently after the restricted feeding. Beef cattle apparently can be fed a low energy maintenance ration without affecting feeding efficiency or meat quality.—*Nutr. Rev. (May, 1957): 139.*

Effect of Animal Fat Fed to Hens.—When a ration containing 10 per cent yellow grease was fed to pullets 9 months old, and one containing 5 per cent to hens 14 months old, the first group dropped in egg production after ten weeks, and the second group after eight weeks. Necropsies showed an excess deposit of body fat, friable and fatty livers, and deposits of fat around the kidneys. There was also increased cholesterol and lipids in the blood plasma and atherosclerosis of the aorta.—*J. Nutr. (Feb. 10, 1957): 267 (AFMA Nutr. Abstr., May, 1957.)*

Vitamin A in Livers of Suckling Pigs.—The vitamin A reserve is low in pigs at birth and decreases during the suckling period if the sow is on a vitamin A-deficient ration. When sows were fed a well-fortified ration and pigs received no other feed, the vitamin A content was 15 μg. per gram of liver at birth and 31 μg. seven days later.—*Proc. Soc. Exptl. Biol. and Med., 91, (1956): 571-572.*

Vitamin C in Goat Milk.—The content of vitamin C in goat milk does not vary significantly from morning to evening, at the outset and end of a milking, or with the type of feed; however, it diminishes with the advancing age of the animal and the stage of pregnancy. Considerable vitamin C is lost from the milk when it is exposed to light.—*Acta Med. Vet. (Nov.-Dec., 1955): 463.*

Steroid Hormones for Fattening Lambs.—Lambs made more rapid and economical gains, at Michigan State University, when given certain hormones. The benefits were relatively similar whether the lambs were fed 3 mg. of stilbestrol daily or were given pellets, subcutaneously in the submaxillary region or ear, containing either 250 mg. of progesterone plus 10 mg. estradiol, or 100 mg. of progesterone plus 10 mg. estradiol, or 50 mg. of testosterone plus 10 mg. estradiol. The absorption of implanted progesterone was low in comparison with the other hormones, especially in the ear. The group given testosterone showed the most restlessness in the feedlot but all treated wether lambs showed a hypertrophy of the secondary sex organs, and both sexes showed mammary development. There were no significant differences in carcass grade.—*J. Anim. Sci. (May, 1957): 283.*

Molasses is now used more in livestock feed than for any other purpose. Some is used in mixed feeds for all types of livestock but chiefly in that for ruminants.—*U.S.D.A., June 7, 1957.*

Editorial

The 1955-1956 Survey of Veterinary Practitioners—Part 1

The 1956 survey of veterinarians conducted by the AVMA Committee on Veterinary Service resulted in the accumulation of a large volume of statistics. Nearly 3,000 of the approximately 10,000 AVMA members in practice took the trouble to fill out and return the questionnaires, a sample sufficient to make the results significant.

The coding of replies and the summarizing of statistics by categories has now been completed. For the benefit of AVMA members, these findings will be presented in a series of editorials which it is hoped will portray an economic profile of typical veterinary practices. The charts seem to indicate differences in trends by regions that may or may not be significant. (Medians rather than means have been used to show averages.)

The average net income of veterinarians engaged in all forms of veterinary practice in 1955 was $10,694; this is 45 per cent higher than the 1950 average of $7,374 (JOURNAL, *124*, June, 1954: 427).

The average incomes of veterinarians are shown (fig. 1), with the states arranged in order of the net income reported in 1955; also shown is the increase in average earnings over those of 1950. The figure reveals a considerable difference in income by states. Wyoming, South Carolina, and Utah reported an average income of less than $7,500 for all veterinarians in practice, while Illinois, Rhode Island, and the District of Columbia reported averages in excess of $13,000.

The average income in only four states (Wyo., S. Car., Ariz., and N. M.) was less than that reported in 1950. There are a few marked changes in the ranking of states. The five states which advanced most are:

	1950	1955
Rhode Island	40th	2nd
Idaho	45th	9th
Indiana	44th	20th
Michigan	41st	21st
Arkansas	49th	26th

The five states which declined most are:

	1950	1955
New Mexico	1st	19th
Florida	7th	24th
Kentucky	8th	30th
Arizona	11th	43rd
Minnesota	12th	31st

The percentage increase in average net income by states (fig. 2) shows some indication of regional differences. (This might be affected by trends in prices and living costs in the regions.) Only five states west of the Mississippi River showed an increase in excess of 50 per cent, while

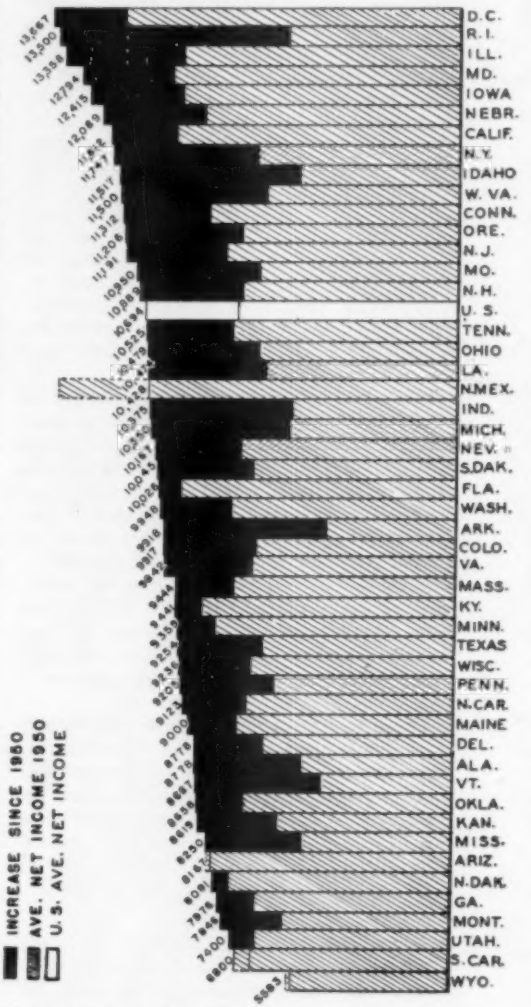


Fig. 1—Average net income of veterinarians, by states, in 1955.

This editorial is the first in a series on the economics of veterinary practice.

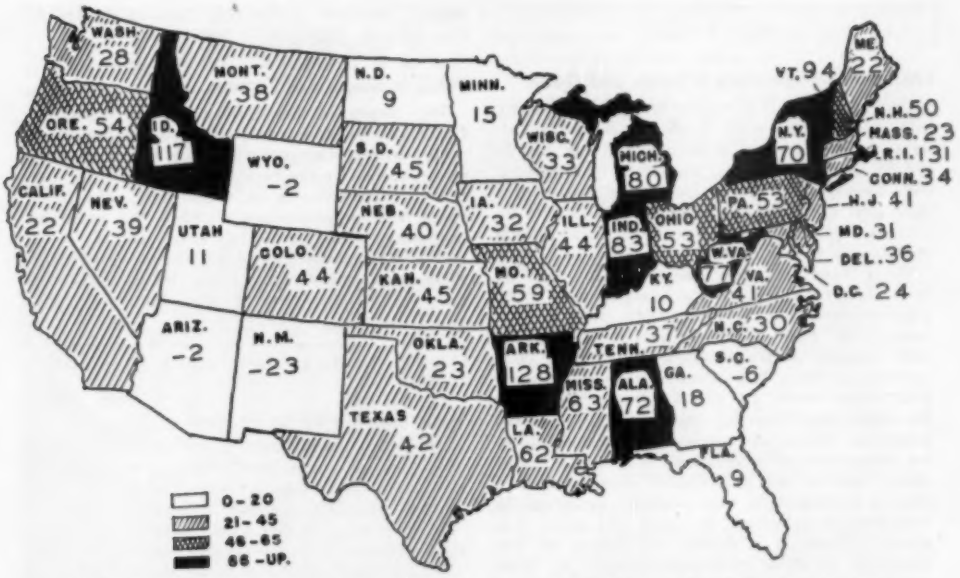


Fig. 2—Percentage of increase in average net income of veterinarians, by states, 1950 to 1955.

ten eastern states showed increases of more than 150 per cent.

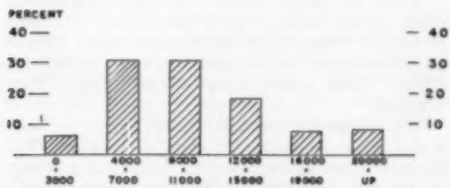


Fig. 3—Percentage of veterinarians in practice with various net earnings.

There appears to be no explanation for the marked differences in the rate of increase of net income shown in the various southern and southeastern states.

Veterinarians' incomes typically fall in a wide range. Some of the factors which determine the position of states on the income scale will be reviewed later.

When practicing veterinarians were grouped according to their earnings in 1955 (fig. 3), 60 per cent reported net incomes between $4,000 and $11,000. This group is equally divided between those with incomes of $4,000 to $7,000 and $8,000 to $11,000. Fewer than 10 per cent reported incomes of less than $4,000 and one third had incomes of more than $12,000.

The number of veterinarians moving to a higher income category appears to be relatively uniform. The largest increase (comparing 1945 and 1950 with 1955), percentage-wise, of practicing veterinarians who earned in excess of a given amount (fig. 4) was in the group which earned more than $12,000 (10% in 1945, and 34% in 1955).

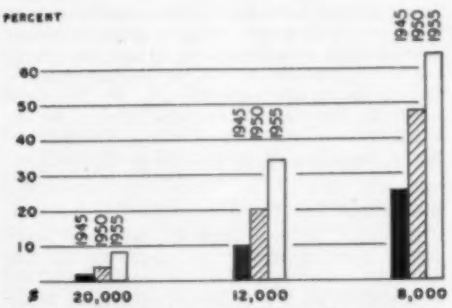


Fig. 4—Percentage of veterinarians with net income in excess of stated amounts, 1945—1950—1955

The number of veterinarians in practice has increased rapidly during the past ten years, and with the corresponding increase in their incomes, it is apparent that a substantial expansion of veterinary service has been provided during this period. This would indicate a corresponding increase in acceptance of its value by the public.

Current Literature

ABSTRACTS

Trichomonad Infections in Swine and Goats

Low level vaginal infections in 2 goats, resulting from inoculations with *Trichomonas foetus* cultures during anestrus, were demonstrable for 29 and 38 days, respectively; numerous trichomonads were found in the uterus, cervix, and vagina of a third goat killed 22 days after inoculation. No infections resulted from one to three intrapreputial inoculations with *T. foetus* in 5 goats.

Of 4 sows inoculated intravaginally with *T. foetus* cultures during estrus, 3 experienced infections demonstrable for three, eight, and 20 days, respectively. Four of 5 sows inoculated similarly with cultures of trichomonads from swine cecal contents, or feces, had infections demonstrable for three, four, seven, 12, and 42 days, respectively; the longest infection was associated with a normal pregnancy. A boar did not become infected following intrapreputial inoculations with either trichomonad species. No pathological changes attributable to trichomonads were observed in any of the experimental infections in swine and goats. The results indicate a relatively low degree of host specificity of these trichomonads.—[*D. M. Hammond, and W. Leidl: Experimental Infections of the Genital Tract of Swine and Goats with Trichomonas Foetus and Trichomonas Species from the Cecum or Feces of Swine. Am. J. Vet. Res., 18, (July, 1957): 461-465.*]

Cultivation of Vibrio Fetus

Incubation (37 C.) of *Vibrio fetus* broth cultures on a gyratory shaker (140 gyrations/min.) gave large yields of cells. The oxygen content of the flasks was reduced by nitrogen substitution. Stationary control flasks gave a light transmittance of 73 per cent in 48 hours, while the shaker technique reduced light transmittance to 13 per cent in 28 hours. No variation in cell morphology was evident in the shaker cultures.—[*G. W. Roberstad and S. M. Morrison: An Improved Method for the Rapid Cultivation of Large Yields of Vibrio Fetus. Am. J. Vet. Res., 18, (July, 1957): 705-707.*]

Methods of Injecting Tuberculin

The effect of three methods—superficial intradermic, deep intradermic, and thrust—of injecting tuberculin were studied in the caudal folds and neck regions of two groups of cattle; one group was sensitized with killed *Mycobacterium tuberculosis* var. *bovis* and the other with *Mycobacterium paratuberculosis*. No significant differences were obtained by the three methods on the caudal folds but, on the neck, the intradermic methods gave larger reactions than the thrust; the deep intradermic gave the largest. The effect of site of injection on the neck was also studied. The lower front sites gave the largest reactions.—[*Aubrey B. Larsen, L. A. Baisden, R. S. Merkal, and M. J. Morris: Methods of Injecting Tuberculin. Am. J. Vet. Res., 18, (July, 1957): 546-549.*]

PPLO in Sinusitis of Turkeys

Two strains of pleuropneumonia-like organisms (PPLO) were isolated from sinus exudate of a turkey during attempted virus isolation. One strain was streptomycin-resistant, pathogenic, and did not readily form colonies on serum agar. The other strain was streptomycin-susceptible and could be propagated easily on PPLO agar.—[*H. E. Adler and R. Yamamoto: Pathogenic and Nonpathogenic Pleuropneumonia-like Organisms in Infectious Sinusitis of Turkeys. Am. J. Vet. Res., 18, (July, 1957): 655-656.*]

BOOKS AND REPORTS

Veterinary Guide for Farmers

There has always been a strong demand for a "do-it-yourself" veterinary book but this one, like the others, can never be a substitute for the training and clinical experience of a veterinarian.

The 371-page book covers the majority of livestock diseases in a nontechnical, abbreviated form. The material presented in some chapters seems to have been taken from the latest articles available but in no case is a reference cited. Much of the material is presented in the form found in the U.S.D.A. Yearbook (1942-1946) dealing with livestock disease.

While the subject matter can not be questioned, much of the material is in abbreviated form and of limited value for an uninformed reader. This is particularly true of the subject matter dealing with "Why Some Cows Don't Settle" and "Hog Cholera."

The dangerous attitude of the author is illustrated by a paragraph found in the preface "The question often arises: To what extent can a farmer be his own veterinarian? Whether or not you can give your animals proper medical attention depends upon your knowledge, your experience, and your native ability. Some people with very little book-learning have a natural knowhow in matters of this kind. If you took a laboratory course at school and if you are mechanically inclined, in all probability you can learn to do everything that is explained in this book." This includes all types of immunization, pregnancy diagnosis, sterility examination, and other veterinary work. Also, the author apparently is of the belief that all readers are expert diagnosticians because diagnosis is discussed only briefly throughout the book.

This book, prepared for livestock leaders, ignores the complexity of disease and the value of diagnosis, thus giving the reader the false impression that there is nothing to veterinary medicine other than manipulative skill.—[*Veterinary Guide for Farmers. By G. W. Stamm. Edited by Dallas S. Burch. 371 pages. Illustrated. Windsor Press, 200 E. Ontario St., Chicago 11, Ill. (1957). Price not given.*]—JOHN B. HERRICK.

THE NEWS

Dr. Jack O. Knowles "Veterinarian of Year"

Dr. Jack O. Knowles, Miami, Fla., was the recipient of the Gaines "Veterinarian of the Year" award for 1956.

Dr. Jack O. Knowles (left) receiving his "Fido" from Mr. Miller.

The selection was made by the Awards Committee of the American Animal Hospital Association and announced at the organization's convention in San Francisco, where Dr. Knowles received his "Fido" from Mr. Harry Miller, director of the Gaines Dog Research Center, New York, N. Y.

Poultry Inspectors Needed

The Poultry Inspection Service of the U.S.D.A. announces openings for graduate veterinarians to fill vacancies in various sections of the country.

Effective July 1, 1957, veterinarians having less than one year professional experience will be employed as a trainee GS-7 at $5,335 per annum. When one years' service is successfully completed, the inspector is promoted to GS-9 at $6,115 per annum. Veterinarians having at least one year of professional experience will be employed at $6,115 per annum.

The above salary rates are based on a 5-day, 40-hour work-week. Any ordered overtime work performed is paid for in addition to the basic salary as prescribed for Federal employees. Qualified persons are promoted to higher positions as openings occur.

No written examination is required. Appointments are made on the basis of applications submitted. Opportunities for advancement are excellent.

Veterinarians interested in part-time or seasonal employment are invited to apply, as some plants operate on a seasonal basis.

Veterinarians interested are requested to write, wire, or phone U.S.D.A., Agricultural Marketing Service, Inspection Branch, Poultry Division, at any of the following offices c/o Dr. J. R. Harney, Room 200, U. S. Custom House, Second and Chestnut Sts., Philadelphia 6, Pa. (phone: Market 7-6000, Ext. 43); c/o Dr. W. S. Buchanan, Room 1014, U. S. Custom House, 610 Canal St., Chicago 7, Ill. (phone: Harrison 7-6910, Ext. 265); c/o Dr. R. B. Mericle, Room 504, Iowa Bldg., Des Moines 9, Iowa (phone: Cherry 3-2171, Ext. 253); or Dr. Harry E. Gaskill, Room 333, Pacific Bldg., 821 Market St., San Francisco 33, Calif. (phone: Yukon 6-3111, Ext. 673 and 674).

AMONG THE STATES AND PROVINCES

District of Columbia

District Association.—The third quarterly meeting of the District of Columbia Veterinary Medical Association was held in the Dart Auditorium of the Armed Forces Institute of Pathology, May 21, 1957. Dr. D. K. Detweiler addressed the group on "Prospectives in Canine Cardiology."

s/WILLIAM I. *GAY, Secretary.*

Iowa

Alumni Homecoming.—The ninth annual veterinary medical alumni homecoming luncheon will be held in the courtyard of the veterinary medicine quadrangle, Iowa State College, on Oct. 26, 1957. Tickets may be purchased in advance or at the door. The homecoming football game, I.S.C. vs. Colorado, will follow the luncheon.

s/R. Y. SEVDE, *Secretary.*

Kentucky

Dr. Singer Appointed State Veterinarian for Kentucky.—Dr. Robert H. Singer, who has served as coordinator of veterinary service for the Kentucky Department of Agriculture and as a member of the Animal Pathology Department of the University of Kentucky, has been appointed state veterinarian for Kentucky.

Dr. Singer graduated from Colorado State University in 1954. He is presently serving as secretary of the Kentucky State V. M. A.

Massachusetts

New Animal Laboratory at University.—An isolation laboratory for the study of infectious diseases of large domestic animals was dedicated at the University of Massachusetts, Amherst, on Wednesday, June 5, in conjunction with the meeting of the Massachusetts

Veterinary Association at the University.

The construction of the building was made possible by a $50,000 donation by Red Acre Farm, Inc., of Stow, Mass., through its manager and treasurer, Miss Harriett G. Bird, and its president, Mrs. Ezra R. Thayer. The building was erected as a memorial to Miss Eleanor A. Thayer.

Michigan

Dr. Brinker Appointed Head, Department of Surgery and Medicine.—Dr. Wade O. Brinker assumed his duties as head of the Department of Surgery and Medicine in the College of Veterinary Medicine at Michigan State University on July 1, 1957. He succeeds Dr. Edward K. Sales who retired June 30. Dr. Sales joined

Dr. Wade O. Brinker

the M.S.U. staff in 1919 and has headed the department since July, 1952.

With the exception of five years in the Army Veterinary Corps (1941-1946), Dr. Brinker has been a faculty member since he joined the staff as a graduate assistant in 1939.

He earned his M.S. degree at Michigan State in 1947, and his D.V.M. at Kansas State College in 1939.

After service in World War II, he returned to M.S.U. and was named an associate professor of surgery and medicine Aug. 1, 1948, and professor on July 1, 1950.

Minnesota

Minnesota Declared Modified Certified Brucellosis Free.—Minnesota was declared modified certified brucellosis free on May 31, 1957. This is the seventh state—and the second this year—to achieve modified certified status in the nationwide program to eradicate brucellosis.

New York

New York State Society.—The regular meeting of the Veterinary Medical Association of New York, Inc., was held June 5, 1957, at the New York Academy of Sciences, New York City. "Distemper Can Be Conquered," an illustrated talk, was presented by Dr. J. A. Baker, director, Veterinary Virus Research Institute, New York State Veterinary College, Cornell University, Ithaca.

s/C. E. DECAMP, *Secretary.*

Ohio

Conference for Veterinarians.—The twenty-sixth annual conference for veterinarians at Ohio State University was held June 12, 1957. Guest speakers included Drs. J. T. McGrath, associate professor of pathology, School of Veterinary Medicine, University of Pennsylvania; G. R. Moore, director of large animal clinic, Michigan State University; and C. C. Turbes, assistant professor, Department of Anatomy, School of Medicine, Indiana University.

The program also included a tour of Sisson Hall, the new building facilities at O. S. U.

s/R. E. REBRASSIER, *Secretary.*

Pennsylvania

Conference for Regulatory Veterinarians.—The second annual animal disease conference for regulatory veterinarians was held on May 24, 1957, under the auspices of the School of Veterinary Medicine, University of Pennsylvania. The theme of this conference was "The Responsibility of the Regulatory Veterinarians in Human and Animal Health." There were in attendance 100 regulatory veterinarians from New Jersey, Delaware, Maryland, and Pennsylvania.

Dr. Edwin D. Tuckerman, assistant professor of regulatory medicine, was chairman of the commitee arranging the conference and was assisted by Drs. Ralph A. Hendershott, A. L. Brueckner, E. D. Leiby, H. A. Milo, W. R. Teeter, and R. R. Marshak. The speakers were: Dr. Mark W. Allam, Philadelphia, Pa.; A. L. Brueckner, College Park, Md.; Theodore Burnstein, West Point, Pa.; Chester F. Diehl, Philadelphia, Pa.; H. L. Easterbrooks, Philadelphia, Pa.; Ralph A. Hendershott, Trenton, N. J.; Aubrey M. Lee, Beltsville, Md.; Edward D. Leiby, Harrisburg, Pa.; Robert R. Marshak, Philadelphia, Pa.; J. J. Martin, Washington, D. C.; Howard A. Milo, Harrisburg, Pa.; and A. F. Ranney, Washington, D. C.

FOREIGN NEWS

Lebanon

Dr. Schwabe to Head Department of Tropical Health.—Dr. Calvin W. Schwabe has been

appointed chairman of the newly established Department of Tropical Health in the Schools of Public Health and Medicine of the American University of Beirut, Lebanon. During the past year, he has headed the Medical School's Department of Parasitology, which has been absorbed by the new department.

Dr. Schwabe received his D. V. M. degree from the Alabama Polytechnic Institute in 1954. He also holds the B. S. degree from Virginia Polytechnic Institute, M. S. from the University of Hawaii, and the M. P. H. and Sc.D. degrees from Harvard University. While at Harvard, he held a postdoctoral research fellowship from the U. S. Public Health Service. In addition to serving research and teaching fellowships in the above institutions, Dr. Schwabe was affiliated for two years with the Angell Memorial Animal Hospital in Boston. His research and teaching interests are in parasitology, veterinary public health, and invertebrate physiology.

s/L. E. POWERS, M.D., *Director.*

VETERINARY MILITARY SERVICE

Military Veterinary Conference.—Army and Air Force veterinary officers attended the third U. S. Army veterinary conference held at Fort McPherson May 22-24, 1957. Visiting speakers included Brig. Gen. E. W. Young, Col. Ralph W. Mohri, Drs. J. H. Steele, Ernest T. Tierkel, J. B. Champlin, C. J. Mikel, and R. W. Carter.

Colonel McNellis Assistant Chief, Veterinary Division.—Colonel Russell McNellis, V.C., U.S. Army, assumed his new duties June 20, 1957, as assistant chief of the Veterinary Division.

Colonel Russell McNellis

A well-known writer on veterinary medicine, Colonel McNellis succeeds Colonel Ralph W. Mohri, V.C., who has been assigned to headquarters, Second U. S. Army, Fort George G. Meade, as chief, Veterinary Division, Medical Section.

• • •

Veterinary officers who completed (May, 1957) the course at the U. S. Army Medical Service Meat and Dairy Hygiene School

Third row—First Lieutenants Lowell C. Walker; John H. Crow; Robert B. Bushnell; Curtis D. Port; Henry A. Virts; Walter E. Tucker, Jr.; Austin C. Norris, Harold K. Chandler; John D. Lynch; Harold D. McGee; Ronald A. Meeks; William J. Clements.

Second row—First Lieutenants Myron C. Rosenberg; Jackie L. Callison; Leonard F. Seda; Donald D. Holmes; John N. Eischen; Thomas T. Elrod; Samuel W. Levingston, III; Roger G. Roop; Major Cahit Aykol (Turkish Army); First Lt. Melvin L. Newman; Captain Nikolaos Giannopoulos (Greek National Army); First Lt. Harry J. Baker.

Front row (left to right)—Master Sergeant Frank J. Smith, first sergeant; Major Wiggo Christensen, adjutant; Major Roy W. Upham, instructor; Major George T. Dalziel, instructor; Lt. Col. Wayne D. Shipley, commandant; Lt. Col. Gordon W. Vacura, director; Major James B. Young, instructor; Capt. Harrison S. Martin, instructor; M/Sgt. John F. Moore, assistant instructor.

COMMENCEMENTS

Graduating Class, 1957, School of Veterinary Medicine, Iowa State College

Top row (left to right)—Richard L. Campbell, Donald A. Dreessen, Donald W. Allgood, Roy E. McGraw, Jr., James A. Holter, Richard L. Stride, Lawrence A. Lacey, Roger L. Larson, Kenneth O. Fertig, Richard F. Harker, Jack P. DeVries, Kenneth B. Meyer.

Second row—Emmert W. Hansen, Marlyn K. Jacobsen, Dr. R. A. Packer, Dr. M. A. Emmerson, Dr. E. A. Hewitt, Dean I. A. Merchant, Dr. E. A. Benbrook, Dr. Robert Getty, Dr. B. W. Kingrey, Halstead Holst, John R. Harman.

Third row—David C. Van Sickle, Gilbert Samuelson, Jr.

Fourth row—James R. Kennedy, Arvin L. Steckelberg.

Fifth row—Arthur M. Lane, Jr., Roger L. Siegert, Jack D. McDowell, Jack L. Scott, Donald D. Wise, Paul O. Leonard, Samuel J. Vainisi, Roger R. Waller, Dean J. Thackrey, Donald R. Fertig, Chester C. Rasmussen.

Sixth row—Harris H. Jorgensen, David J. Drees, Bruce H. Ewald, Stanley E. Held, Richard I. Houck, Russell D. Van Marel, Ralph D. Schwake, David E. Tyler, Franklin H. Dierenfeld, James W. Carberry, Garrett Zoet, Raymond L. Morter.

Seventh row—Bernard D. Maney, Charles H. Glotfelty, John R. Oltman, Laurnie W. Nelson, Joseph H. Krichel, Ralph J. Schwartz, Tom K. Spencer, Cecil D. Behunin, Robert F. Huspen, Oscar C. Walker, Stanley K. Harris, Rulan S. Hansen.

Iowa State College.—At the 1957 commencement exercises of the College of Veterinary Medicine, Iowa State College, the following 55 candidates were presented for the D.V.M. degree:

Donald W. Allgood
Cecil D. Behunin
Richard L. Campbell
James W. Carberry
Jack P. DeVries
Franklin H. Dierenfeld
David T. Drees
Donald A. Dreessen
Bruce H. Ewald
Donald R. Fertig
Kenneth O. Fertig
Charles H. Glotfelty
Emmert W. Hansen
Rulan S. Hansen
Richard F. Harker
John R. Harman
Stanley K. Harris
Stanley E. Held
Halstead Holst
James A. Holter
Richard I. Houck
Robert F. Huspen
Marlyn K. Jacobsen
Harris H. Jorgensen
James R. Kennedy
Joseph H. Krichel, Jr.
Lawrence A. Lacey
Arthur M. Lane, Jr.

Roger L. Larson
Paul O. Leonard
Jack D. McDowell
Roy E. McGraw, Jr.
Bernard D. Maney
Kenneth B. Meyer
Raymond L. Morter
Laurnie W. Nelson
John R. Oltman
Chester C. Rasmussen
Gilbert Samuelson, Jr.
Ralph D. Schwake
Ralph J. Schwartz
Jack L. Scott
Roger L. Siegert
Tom K. Spencer
Arvin L. Steckelbert
Richard L. Stride
Dean J. Thackrey
David E. Tyler
Samuel J. Vainisi
Russell D. Van Marel
David C. Van Sickle
Oscar C. Walker
Roger R. Waller
Donald D. Wise
Garret Zoet

Graduating Class, 1957, School of Veterinary Medicine, University of Montreal

Top row (left to right)—Dr. Jacques St. Georges, Dr. J. D. Nadeau, Dr. Gustave Labelle, Mgr. Irene Lussier, Dr. Joseph Dufresne, M.L'Abbe G. E. Phaneuf.
Second row—Jean-Louis Caza, Jean-Marc St.-Yves, Patrick Guay, Charles Leonard, André Grenon, Gilbert Dugré, Claude Martin, Jean Desrochers, Alain Bourges, Maurice Morissette.
Third row—Conrad L'Ecuyer, Serge Renaud.
Fouth row—Nicolas Platonow, Jean Piérard, Bernard Roch, Guy Ouellet, Roger Lafrance, Bernald Pillet.

• • •

University of Montreal.—At the 1957 commencement exercises of the School of Veterinary Medicine, University of Montreal, the following 18 candidates were presented for the D.V.M. degree:

Alain Bourges
Jean-Louis Caza
Jean Desrochers
Gilbert Dugré
André Grenon
Patrick Guay
Roger Lafrance
Conrad L'Ecuyer
Charles Leonard
Claude Martin
Maurice Morissette
Guy Ouellet
Jean Piérard
Bernard Pillet
Nicolas Platonow
Serge Renaud
Bernard Roch
Jean-Marc St.-Yves

Ohio State University.—At the 1957 commencement exercises of the School of Veterinary Medicine, Ohio State University, the following 69 candidates were presented for the D.V.M. degree:

Scott D. Apt, Jr.
Robert C. Baisch
Donald L. Beckett
Donald E. Bidlack
George R. Blind
Gerald L. Bradford
James E. Brehm
Duane H. Bricker
John P. Bryk
Herbert H. Chance
Byron L. Cohen
Dale R. Cornett
William R. Cox
Charles R. Cutler
James L. Davis
Robert E. Dickerson
Paul L. Dieterlen
Bruce L. Doerr
Charles R. Dorn
Arthur R. Ebert
Wade G. Gardner
Don C. Gibson

Olen Givens, Jr.
Conrad F. Glaab
Roger A. Grier
Adam B. Hahn
Oscar E. Harrison
Harold W. Hauger
Charles L. Herwick
William E. Holland, Jr.
Walter B. Homan
Ronald L. Janes
Gordon F. Johnson
Luther A. Johnson
John R. Jones
Robert J. Kilgore
Leo J. Kline
George A. Kukor
Jack C. Leighty
David S. Lowe
Robert D. Manning
Phillip C. Martin
Davis A. McCue
John W. Miller
Richard M. Miller
Joseph P. Mitchell
Sidney A. Myers
Wayne E. Nichols
William E. Palich
Leonard C. Pensis
Ralph G. Perkins
James A. Ray
Herman J. Rehder
Lowell E. Ripley
James D. Roswurm
William L. Schwartz
Frederick J. Sharp
John P. Shebanek, Jr.
Richard W. Siebert
James R. Somerville
Ross C. Spence
Alden E. Stilson
Ralph W. Storts
Larry K. Sunbury
Howard T. Terrill
Kent A. Vasko
Allen Wolff
Raymond D. Zinn
Leland H. Zollat

Graduating Class, 1957, College of Veterinary Medicine, Ohio State University

Top row (left to right)—Robert D. Manning, Herman J. Rehder.

Second row—James D. Roswurm, Gerald L. Bradford, Richard W. Siebert, Howard F. Terrill, Robert E. Dickerson, William L. Schwartz.

Third row—Leonard C. Pensis, Herbert H. Chance, William E. Holland, Jr., Oscar E. Harrison, Bruce I. Doerr, Charles L. Herwick.

Fourth row—Wade G. Gardner, Duane H. Bricker, Frederick J. Sharp, John P. Shebanek, Jr., William E. Palich, Paul L. Dieterlen, John R. Jones, Adam B. Hahn, Dale R. Cornett, Alden E. Stilson.

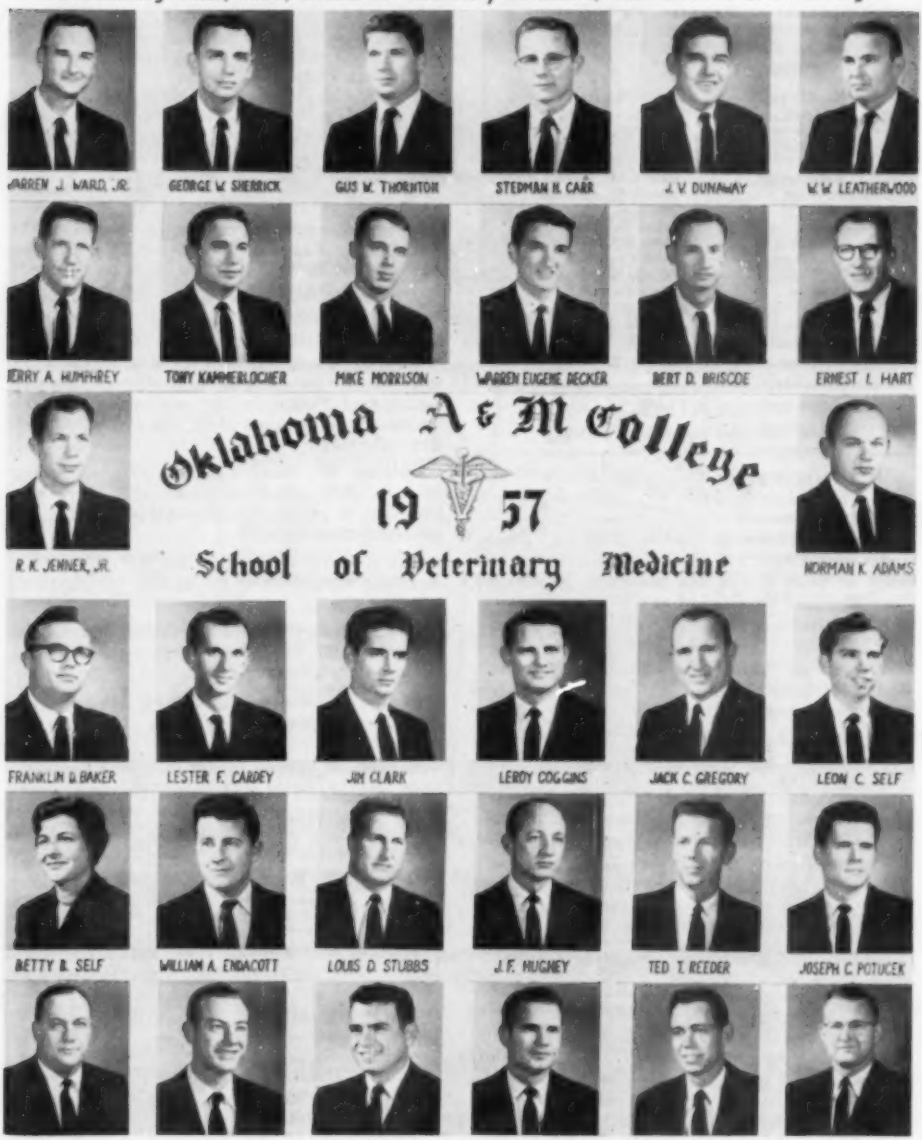
Fifth row—Charles R. Dorn, Robert C. Baisch, Leland H. Zollar, Ross C. Spence, Sydney A. Myers, Joseph P. Mitchell, Byron L. Cohen, Luther A. Johnson, Don C. Gibson, William R. Cox, Harold W. Hauger.

Sixth row—Lowell E. Ripley, Gordon F. Johnson, Raymond D. Zinn, James R. Somerville, James A. Ray, Walter B. Homan, Richard M. Miller, Roger A. Grier, Olen Givens, Jr., John P. Bryk, James E. Brehm.

Seventh row—Larry K. Sunbury, Ronald L. Janes, Allen Wolff, Donald E. Bidlack, Davis A. McCue, Leo J. Kline, Wayne Nichols, Ralph W. Storts, Arthur R. Ebert, Jack C. Leighty, George R. Blind.

Eighth row—Donald L. Beckett, George A. Kukor, David S. Lowe, Scott D. Apt, Jr., Phillip C. Martin, John W. Miller, Robert J. Kilgore, Kent A. Vasko, James L. Davis, Charles R. Cutler, Ralph G. Perkins.

Graduating Class, 1957, School of Veterinary Medicine, Oklahoma A. & M. College



Top row (left to right)—Warren J. Ward, Jr., George W. Sherrick, Gus W. Thornton, Stedman H. Carr, Jerry V. Dunaway, William W. Leatherwood.

Second row—Jerry A. Humphrey, Tony Kammerlocher, Michael H. Morrison, Warren E. Decker, Bert D. Briscoe, Ernest I. Hart.

Third row—Ralph K. Jenner, Jr., Norman K. Adams.

Fourth row—Franklin D. Baker, Lester F. Cardey, James L. Clark, Leroy Coggins, Jack C. Gregory, Leon C. Self.

Fifth row—Betty B. Self, William A. Endacott, Louis D. Stubbs, James H. Hughey, Theodore T. Reeder, Joseph C. Potucek.

Sixth row—James B. Roberts, Carroll D. Olson, Calvin M. Poole, William G. Askew, Harvey L. Arnold, John L. Weeks.

(Commencement list on following page.)

Oklahoma A. & M. College.—At the 1957 commencement exercises of the School of Veterinary Medicine, Oklahoma A. & M. College, the following 32 candidates were presented for the D.V.M. degree:

Norman K. Adams	Ralph K. Jenner
Harvey L. Arnold	Anton Kammerlocher
William G. Askew	William W. Leatherwood
Franklin D. Baker	Michael H. Morrison
Bert D. Briscoe	Carroll D. Olson
Lester F. Cardey	Calvin M. Poole
Stedman H. Carr	Joseph C. Potucek
James L. Clark	Theodore T. Reeder
Leroy Coggins	James B. Roberts
Warren E. Decker	Betty B. Self
Jerry V. Dunaway	Leon C. Self
William A. Endacott	George W. Sherrick
Jack C. Gregory	Louis D. Stubbs
Ernest I. Hart	Gus W. Thornton
James H. Hughey	Warren J. Ward
Jerry A. Humphrey	John L. Weeks

(*Commencement picture on p.* 165.)

DEATHS

Star indicates member of AVMA

G. H. Anderson (KCV '11), 73, Holdrege, Neb., died May 25, 1957. Dr. Anderson is survived by his widow.

Loy L. Anderson (MCK '09), 76, Argos, Ind., died May 20, 1957. Dr. Anderson had been in poor health for the past 18 months. One daughter survives.

Bruce Baker (COL '19), 63, Meeker, Colo., died recently.

Wilfred E. Catt (IND '16), 78, Arlington, Ind., died May 5, 1957. Dr. Catt was a general practitioner and had been a member of the AVMA. He is survived by his widow.

★**Lester C. Clark** (MCK '19), 69, Rushville, Ill., died May 14, 1957. Dr. Clark was associated with the Division of Livestock Industry, Department of Agriculture. He was a member of the AVMA. His widow and one son survive.

Walter R. Cox (ONT '08), 75, Flint, Mich., died May 1, 1957. Dr. Cox retired last August. He had been a member of the AVMA. His widow and two daughters survive.

R. E. Curtis (MCK '08), 73, Ransom, Ill., died May 26, 1957. Dr. Curtis had been a member of the AVMA. He is survived by his widow, three daughters, and one son.

H. Ernest Defendorf (CVC '09), 68, Grand Blanc, Mich., died May 23, 1957. Dr. Defendorf was a general practitioner and operated an animal hospital in Grand Blanc. His widow and two sons survive.

Robert B. Jones (KCV '13), 75, Wadesboro, N. Car., died May 26, 1957. Dr. Jones served as an officer in the Veterinary Corps in World War I, and later was a general practitioner in Wadesboro. He had been a member of the AVMA. His widow and two daughters survive.

Clement Kelnhofer (WES '05), 81, died Jan. 22, 1957, in Medford, Wis., where he had practiced for more than 50 years.

James M. Lawson (KCV '10), 83, Montgomery, Ala., died Feb. 3, 1957. Dr. Lawson had served with the BAI, U.S.D.A., for a number of years after which he did stockyard work for several years. He had supervised the Union Stockyards in Montgomery, Ala., prior to his retirement in 1945. His widow and one daughter survive.

Louis M. Lounsbery (COR '18), 64, Newburgh, N. Y., died May 10, 1957. Dr. Lounsbery was a veteran of World War I, and had served as chief of the foods and drugs section of the New Jersey Board of Health for 23 years. His widow survives.

William O. McHugh (ONT '97), Zanesville, Ohio, died May 26, 1957. Dr. McHugh was associated with the U. S. Department of Health for 34 years. During World War I, he was chief civilian inspector of all meat used by the Armed Forces in the northeastern states. Dr. McHugh is survived by his widow and two step-daughters.

Charles W. Neal (TEX '31), 54, Siloam Springs, Ark., died April 10, 1957. Dr. Neal had been a member of the AVMA and was a general practitioner.

Asa J. Royal (USC '15), 66, Midnight, Miss., died May 6, 1957. Dr. Royal had been a member of AVMA.

Lewis Spolum (ISC '30), Olivia, Minn., died April 14, 1957. Dr. Spolum was a general practitioner. His widow survives.

George L. Simon (CVC '94), Marion, Ind., died recently. Dr. Simon was a general practitioner.

Earnest R. Teich (CVC '14), 68, Velva, N. Dak., died April 24, 1957. Dr. Teich was a general practitioner, and had in recent years served with the Agricultural Research Service. He is survived by his widow and two daughters.

George D. Warren (MCK '07), Kankakee, Ill., died April 17, 1957. He had been ill for some time.

Charles F. Woolston (GR '05), 77, Orleans, Mich., died April 7, 1957. Dr. Woolston retired from general practice in 1941. He is survived by his widow, one daughter, and three sons.

• • •

Other Deaths Reported.—The following deaths have been reported. The usual information for an obituary was not supplied.

Rudolph E. Hanson (MCK '10), Forest City, Iowa.

Clifford J. Sparks (CVC '07), Sully, Iowa.

Richard E. Surring (ISC '16), Oklahoma City, Okla.

Frank A. Wright (UP '07), Moorestown, N.J.

Earl F. Whipple (COR '23), Rochester, N. Y., died on Jan. 12, 1957.

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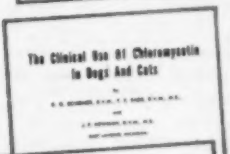
by James E. Cook, D.V.M.

Reprint, *The North American Veterinarian*

CHLOROMYCETIN THERAPY IN AN OUTBREAK OF HARD PAD

by M. B. Toosey, M.R.C.V.S.

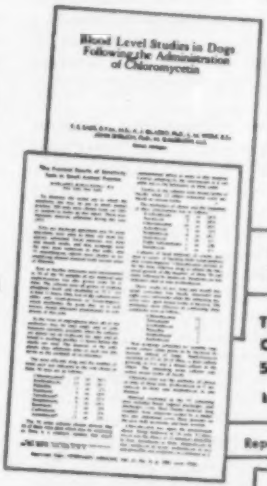
Reprint from *The Veterinary Record*



THE CLINICAL USE OF CHLOROMYCETIN IN DOGS AND CATS

by R. G. Schirmer, D.V.M., F. E. Eads, D.V.M., M.S., and J. P. Newman, D.V.M., M.S.

Reprint from *Veterinary Medicine*



BLOOD LEVEL STUDIES IN DOGS FOLLOWING THE ADMINISTRATION OF CHLOROMYCETIN

by F. E. Eads, D.V.M., M.S.; A. J. Glazko, Ph.D.; L. M. Wolf, B.S.; John Ehrlich, Ph.D.; M. Galbraith, M.S.

Reprint from the *American Journal of Veterinary Research*

CHLOROMYCETIN INTRAMUSCULAR IN SHIPPING FEVER IN CALVES

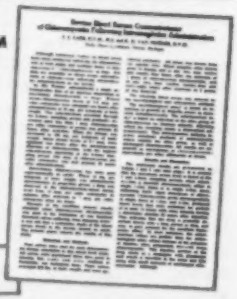
by R. W. Barnes, D.V.M.

Reprint, *The North American Veterinarian*

THE PRACTICAL RESULTS OF SENSITIVITY TESTS IN SMALL ANIMAL PRACTICE

by Margaret Schlichting, B.A.

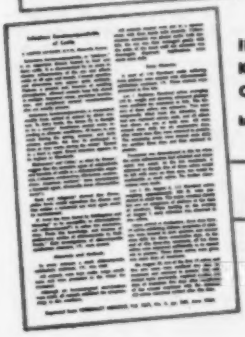
Reprint from *Veterinary Medicine*



BOVINE BLOOD SERUM CONCENTRATIONS OF CHLOROMYCETIN FOLLOWING INTRAMUSCULAR ADMINISTRATION

by F. E. Eads, D.V.M., M.S. and K. D. Van Hecker, D.V.M.

Reprint from *The California Veterinarian*



INFECTIOUS KERATOCONJUNCTIVITIS OF CATTLE

by S. Lester Jackson, D.V.M.

Reprint from *Veterinary Medicine*

***THESE AND OTHER PUBLICATIONS ON CHLOROMYCETIN AVAILABLE ON REQUEST**

VETERINARY DEPARTMENT

PARKE, DAVIS & COMPANY

Detroit 32, Michigan · Toronto 14, Ontario

AVMA Golf Tournament at Cleveland

Beautiful Columbia Hills Country Club awaits you Aug. 19, 1957. The AVMA will have exclusive use of the facilities of the Club for the golf tournament starting at 2:00 p.m. Bus service from downtown will be available. Dinner at the Club, golf, and transportation is included in the very modest $10 fee.

In addition to the annual two-man team competition for the AVMA trophy, many other trophies and prizes will be awarded.

Polish up your own sticks or rent clubs at the "pro" shop, but make definite plans now to participate in this year's fun at the golf tournament. Registration forms will be available when you register for the convention.

STUDENT CHAPTER ACTIVITIES

California Chapter.—A resumé of the activities of the University of California Student Chapter of the AVMA for the spring of 1957 follows:

On February 7, Drs. Straub and Theilen, members of the staff, spoke about the differences in dairy practice in Germany, Oregon, and California. Plans were made for the spring formal, picnic day float, and open house. The attendance was: seniors 16, juniors 24, sophomores 24, freshman 15.

Dr. G. E. McDaniels, Jr. ('54), on March 6, spoke about the alumni association and its activities. The attendance was: seniors 14, juniors 26, sophomores 13, freshman 12. On April 3, Mr. Dan Kelly, business manager of the Woodland Clinic, told of the organization of the clinic and some of the business procedures used there. Nominations for Chapter officers for the fall semester were held. The attendance was: seniors 23, juniors 22, sophomores 17, freshman 19.

Dr. Jasper, dean of the veterinary school, administered the Veterinarian's Oath to the seniors at the May 1 meeting. President Warner presented the trophy, given each year to the most outstanding class as determined by attendance at Chapter meetings and class participation in sports, to the senior class president.

The following officers were elected: Horace Warner, president; Jerry Krupp, president-elect; Harry Dingwall, vice-president; Robert Smith, secretary; and Marty Fineman, treasurer.

General Kester addressed a special meeting of the group on May 9. There were 33 seniors, 27 juniors, 20 sophomores and 3 freshmen in attendance.

s/ ROBERT H. SMITH, *Secretary.*

• • •

Kansas Chapter.—The Kansas State College Student Chapter of the AVMA met on February 19 to hear Mr. Charles Reed, of a jewelery shop in Manhattan, discuss diamonds and diamond cutting.

At the March 5 meeting, a raffle was held for chapter members with the proceeds going into the chapter's treasury. The guest speaker for the meeting was Professor Earl Davis, head of the English department. A film, "How to Train You to Train Your Dog," highlighted a meeting on March 19.

On April 2, two students from the junior class were selected to attend the AVMA convention. A date was set for the annual picnic with the Oklahoma A. & M. student chapter. Dr. Maynard Curts, Kansas City, Kan., discussed professional ethics, stressing the importance of good public relations in veterinary medicine. Mr. L. Harris, Lincoln, Neb., spoke on "Practical Endocrinology" at the April 16 meeting. The senior banquet and spring dance were held April 27 at the Terrace Room of the Hotel Wareham, Manhattan. Dr. C. L. Meginnis, Peoria, Ill., gave an interesting speech on the future of veterinary medicine and some of the problems confronting a new graduate.

On May 14, it was announced that the chapter's intramural athletic teams had won the intramural championship title for all sports. A committee was formed for the advancement of the Dr. McCleod Memorial Scholarship for freshman veterinary students. Officers were elected for the fall semester.

At the various meetings, several senior veterinary students gave interesting accounts of their summer experiences.

s/J. F. CUKJATI, *Secretary.*

APPLICATIONS

Applicants—Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative Bylaws.

BARTON, GEORGE F. R.
214 Spadina Ave., Chilliwack, B.C.
D.V.M., Ontario Veterinary College, 1932.

KALNINS, VILIS
10th St., Wisher, N. Dak.
D.V.M., University of Riga, 1940.

SCHMID, FRANZ A.
1381 York Ave., New York 21, N.Y.
D.V.M., University of Munich, 1951.

SLEIGHT, STUART D.
637 Fuller St., Columbus, Wis.
D.V.M., Michigan State University, 1951.

Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative Bylaws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Alabama Polytechnic Institute*

First Listing

All of the following applicants, with the exception of those otherwise noted, were vouched for by Drs. A. A. Leibold and W. J. Gibbons.

ALLEN, RALPH W., D.V.M.
308 Hollywood Parkway, Hollywood, Fla.
BELLAR, FRANK F., D.V.M.
Hickman, Tenn.
Vouchers: A. A. Leibold and R. S. Sugg.
BRANSCOME, WILLIAM G., JR., D.V.M.
Highway St., S., Grenada, Miss.
Vouchers: A. A. Leibold and R. S. Sugg.
BRIDGMAN, EDGAR A., D.V.M.
Rt. 1, Tallassee, Ala.
Vouchers: A. A. Leibold and R. S. Sugg.
BRYAN, MONROE J., D.V.M.
Rt. 11, Box 460, Birmingham, Ala.
Vouchers: A. A. Leibold and R. S. Sugg.
BURCH, DONALD L., D.V.M.
202 E. Duval St., Live Oak, Fla.
Vouchers: A. A. Leibold and R. S. Sugg.
BURRIS, RICHARD A., JR., D.V.M.
Smithdale, Miss.
CARROLL, GLYN O., D.V.M.
Newbern, Tenn.
CHAPMAN, WILLIE L., JR., D.V.M.
Rt. 7, Chattanooga, Tenn.
CLAWSON, GEORGE R., D.V.M.
Speedwell, Tenn.
CROWE, M. WARD, D.V.M.
294 W. Noell Ave., Madisonville, Ky.
DENNEY, JACK F., D.V.M.
Monticello, Ky.
DICKSON, THOMAS G., D.V.M.
Box 44, Pahokee, Fla.
EMBRY, ROBIN W., D.V.M.
Snowdown, Ala.
EPPELE, PAGE M., D.V.M.
Brooksville, Fla.
FARNELL, DANIEL R., D.V.M.
2760 Pleasant Valley Rd., Mobile, Ala.
GEORGE, LLOYD W., D.V.M.
P.O. Box 184, Ellenton, Fla.
GIBBONS, DONALD C., D.V.M.
Rt. 2, Deatsville, Ala.
GRISSOM, CHARLEY P., D.V.M.
Rt. 1, Dorsey, Miss.
HAIL, ROBERT L., D.V.M.
Rt. 53, Somerset, Ky.
HARDING, ELDRED T., D.V.M.
R.R. 2, Ewing, Ky.
Vouchers: A. A. Leibold and R. S. Sugg.
HARTSFIELD, JOHN J., D.V.M.
8103 7th Ave., S., Birmingham, Ala.
Vouchers: A. A. Leibold and R. S. Sugg
HATCHETT, DAVID E., D.V.M.
209 S. Race St., Glasgow, Ky.
Vouchers: A. A. Leibold and R. S. Sugg.
HAWTHORNE, CHARLES H., D.V.M.
P.O. Box 931, Tavares, Fla.
HENDRICKS, JOSEPH B., D.V.M.
624 Keith St., Anniston, Ala.
HOWORTH, GRAHAM L., D.V.M.
1107 Highland Ave., Selma, Ala.
HUDSON, JERROLD L., D.V.M.
P.O. Box 30, Waynesboro, Miss.
JETER, WILLIAM E., D.V.M.
Rt. 3, Box 570, Millington, Tenn.
JOHNS, KENT, D.V.M.
Frisco City, Ala.
JONES, HILMER L., D.V.M.
317 W. Glenn, Auburn, Ala.
KINCAID, EVERETT, D.V.M.
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C I B A

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8/2462VM

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All of the following applicants, with the exception of those otherwise noted, were vouched for by Drs. J. A. Henderson and T. L. Jones.

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7 Robbie Ave., Downsview, Ont.
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Peter Pan Farm, R.D. 4, McDonald, Pa.

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555 Somerset W., Ottawa, Ont.

CUCUEL, JEAN-PAUL E., D.V.M.
4414 Beaconsfield Ave., Montreal, P.Q.

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Carnduff, Sask.

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73½ Cedar St., Galt, Ont.

IKEDA, JEANNE V. A., D.V.M.
1821 Gerrard St., E., Toronto, Ont.

KELTON, OSWALD W., D.V.M.
R.R. 2, Pefferlaw, Ont.

KLASSEN, ERNST, D.V.M.
Box 8, Waldheim, Sask.

KNIRSCH, A.K.E., D.V.M.
R.R. 2, Breslau, Ont.

LUYKEN, HANS, D.V.M.
30 Albert St. N., Orillia, Ont.

MACDONALD, DONALD S., D.V.M.
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Vouchers: T. L. Jones and H. S. MacDonald.

MACLEAN, SANFORD A., D.V.M.
407 Palmer House, Assiniboine & Hargrave, Winnipeg, Man.

MERCIER, GEORGE F., D.V.M.
9 South St., Farmington, Maine.

MISENER, E. BRUCE, D.V.M.
c/o Dr. Len Elmes, Galt, Ont.

NEWTON, DONALD K., D.V.M.
14 Hunt St., Hamilton, Ont.
Vouchers: T. L. Jones and J. F. Cote.

NIILO, LEO, D.V.M.
23 Silverton Ave., Downsview, Ont.

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Aurora Animal Hospital, Box 899, Aurora, Ont.

O'CONNOR, DENIS R., D.V.M.
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PERCY, DEAN H., D.V.M.
Forest Veterinary Clinic, Forest, Ont.
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Box 1368, Duncan, Vancouver Island, B. C.
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WILLOUGHBY, RUSSELL A., D.V.M.
Wolseley, Sask.

WOLFE, WALTER J., D.V.M.
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DEVOE, JAMES F., V.M.D.
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Vouchers: J. H. Mark and J. T. McGrath.

TOMS, LAWRENCE S., V.M.D.
West Brattleboro, Vt.
Vouchers: R. R. Marshak and D. G. Lee.

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COTHRAN, LAVAL N., D.V.M.
2440 Cumberland St., Philadelphia, Pa.
Vouchers: G. W. Cooper and E. T. Braye.

GONZALEZ, ELIEZER H., D.V.M.
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Additions to the AVMA Film Library

Your Meat Inspection Service

	Color;	Produced by	Rental
16 mm.	Running time	U.S.D.A.	$2.50
Sound	27½ min.		

This is a new film on federal meat inspection produced in conjunction with the fiftieth anniversary of the Meat Inspection Act. It portrays very well a federal service; however, too little is said about the role of veterinary medicine in this important field of food hygiene.

The film is cleared for television use and is recommended for local showings.

Brucellosis Ring Test

	Color;	Produced by	Rental
16 mm.	Running time	U.S.D.A.	$1.00
Sound	5¾ min.		

This short film introduces the methods and techniques of a presumptive herd test for brucellosis. The ring test is applied to milk samples and results are shown.

The primary use of this film will be to explain the value of the test to farm groups and others interested in brucellosis control, and to stimulate increased interest in brucellosis eradication.

Stress and the Adaptation Syndrome

	Color;	Produced by Research &	
16 mm.	Running time	Scientific Films, Inc.,	Rental
Sound	35 min.	and Campus Film Productions, Inc.	$2.50

This is a medical teaching film made in collaboration with Hans Selye, M.D., Institute for Experimental Medicine and Surgery, University of Montreal, Canada. The film was sponsored by Pfizer Laboratories.

It presents the concept of "stress" by reviewing the original experiments of Dr. Hans Selye in 1936. The stages of the general adaptation syndrome (alarm reaction, state of resistance, stage of exhaustion) are demonstrated.

Animation illustrates what is known about the mechanics of stress. This film is highly recommended as a teaching film and for showings to veterinary groups. It is not intended for showing to lay audiences.

An Aid to Therapy (Bacterial-Antibiotic Susceptibility Testing)

	Color;	Produced by Campus Film	Rental
16 mm.	Running time	Productions, Inc., and	$2.50
Sound	26 min.	Pfizer Laboratories	

This is a medical teaching film designed to acquaint the practitioner with the various methods of bacterial-antibiotic susceptibility testing as a guide in making the best use of these aids in antibiotic therapy.

The disc test and the quantitative tube dilution method are presented in sufficient detail to convey the principles upon which they are based. Although the film contains considerable information on laboratory techniques, it is not intended for laboratory teaching. The emphasis is on the usual tests which are employed as guides to antibiotic therapy.

While veterinary practitioners will not have as great a demand for this type of service as physicians, nevertheless, veterinarians should be familiar with this procedure and be in a position to use it in those cases where it is impossible to select an effective antibiotic purely on the basis of a clinical diagnosis alone.

The film is recommended for teaching in veterinary colleges and at meetings of local veterinary medical associations. It is not suitable for lay viewing.

Films Available from Other Sources

Partners for Healthier Swine

16 mm. Sound	Color; Running time 35 min.	Produced by Moss Film Productions for Cutter Laboratories	Available from Haver-Lockhart Laboratories, P.O. Box 676, Kansas City, Mo.

This film is designed to show the necessary relationship between the swine grower and his veterinarian in producing healthy swine for market.

Sanitation and the McLean County (Illinois) system of preventing parasite infestation are emphasized. A number of swine diseases are discussed stressing the necessity of having healthy pigs for successful hog cholera immunization.

Diseases discussed are atrophic rhinitis, swine erysipelas, necrotic enteritis, pneumonia, gut edema, and hog cholera. The photography portraying symptoms and pathology found in these diseases is excellent.

The development of newer immunizing agents is touched on briefly.

From a technical and professional viewpoint, too much stress is placed on the dangers of using hog cholera immunizing agents in herds where chronic swine erysipelas is known to exist, and the description given of necrotic enteritis more closely resembles hemorrhagic dysentery.

It is also unfortunate that the sequences depicting a necropsy show the person handling pathological material with bare hands and permitting his clothing to become soiled by the carcass. Some veterinarians may also be inclined to criticize the technique employed in vaccination.

In spite of these shortcomings, the film should be of value to veterinarians in explaining swine disease problems to farm groups.

Common Diseases of Baby Pigs

16 mm. Sound	Color; Running time 25 min.	Produced by Moss Film Productions for Haver-Lockhart Laboratories	Available from Haver-Lockhart Laboratories, Kansas City, Mo.

This film is quite similar to the film "Partners for Healthier Swine," except emphasis is given to those diseases most commonly found in baby pigs.

Sanitation, rotation of pastures, management of farrowing sows, and selection of healthy breeding stock from disease-free herds is stressed. The common diseases of baby pigs, discussed in the film, include swine erysipelas, anemia, mange, round worms, bacterial swine pneumonia, enteritis, and hog cholera.

Veterinarians using the film for farm groups may disagree with the mortality figures given for transmissible gastroenteritis and will object to the description of necrotic enteritis in the age of pigs shown.

In spite of minor shortcomings, this should be a valuable film for veterinarians engaged in practice when requested to participate in a program on swine diseases.

Handling Laboratory Animals

16 mm. Sound	Black & white; Running time 12 min.	Produced by MacQueen Film Organization	Available from Animal Care Panel, Inc., 951 E. 58th St., Chicago 37, Ill.

This film, produced in cooperation with the National Institute for Medical Research (England), demonstrates desirable methods to be emphasized in handling various laboratory animals.

Methods recommended are designed to eliminate the hazard of injury to either the animal or the person attempting to remove animals from cages or during restraint required for laboratory procedures.

The film should be useful for instruction prior to laboratory classes in which animals are to be used.

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Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals, which is ethical publication procedure.

Manuscripts.—Manuscripts, including **footnotes, references,** and **tables,** must be typewritten, **double-spaced,** on 8½- by 11-in. bond paper, and the **original,** not the carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise and to the point. Short, simple sentences are clearer and more forceful than long, complex ones.

Illustrations.—Photographs should be furnished in glossy prints, and of a size that will fit into the JOURNAL of the American Veterinary Medical Association with a minimum of reduction. Photomicrographs which can not be reduced should be marked for cropping to 1-column or 2-column width. Identifying marks within the photomicrographs, such as arrows, letters, or numbers, should be clearly marked with black India ink or white opaque ink to insure good reproduction and must be large enough to stand reduction, if necessary.

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References.—References should be typed **double space** and should be prepared in the following style: name of author, title of article, name of periodical with volume, year, and page numbers. References to journals not commonly known should give the complete name of the periodical, and where published so that they may be added to our reference files. When books are cited, the name of publisher, location, edition, and year should be given.

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Kinsley, A. T.: J.A.V.M.A. New Series 1:49 (Oct.) 1915.
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Aitken, W. A.: Animal Diseases, U.S.D.A. Yearbook of Agriculture, 1956, p. 255.
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COMING MEETINGS

Colorado Veterinary Medical Association. Annual meeting. LaCourt Hotel, Grand Junction, Aug. 9-10, 1957. G. H. Gilbert, 5500 Wadsworth Blvd., Arvada, Colo., secretary.

American Association of Veterinary Bacteriologists. Annual meeting. Ohio State University, Columbus, Ohio, August 16, and the Ohio Agricultural Experiment Station, Wooster, Aug. 17, 1957. C. H. Cunningham, College of Veterinary Medicine, Michigan State University, East Lansing, secretary.

American Veterinary Medical Association. Annual meeting. Cleveland Auditorium, Cleveland, Ohio, Aug. 19-22, 1957. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

New Mexico Veterinary Medical Association. Annual meeting. Albuquerque, Sept. 9-10, 1957. William E. Kraus, 3018 Rio Grande Blvd., N.W., Albuquerque, president.

Washington State Veterinary Medical Association. Annual meeting. Monticello Hotel, Longview, Sept. 9-10, 1957. William F. Harris, 1102 E. Main St., Puyallup, Wash., secretary.

New York State Veterinary Medical Society. Annual meeting. Hotel Statler, Buffalo, Sept. 11-13, 1957. M. H. Covert, 138 Inglewood Dr., Rochester 19, N. Y., secretary.

Northern Illinois Veterinary Medical Association. Fall meeting. Rockford, Sept. 18, 1957. J. G. Hardenbergh, 121 Bridge Street, Rockton, Ill., secretary-treasurer.

District of Columbia Veterinary Medical Association. Third annual all-day meeting. Walter Reed Army Medical Center, Oct. 1, 1957. William I. Gay, 5200 Chandler St., Bethesda 14 Md., secretary.

New England Veterinary Medical Association. Annual meeting. Equinox House, Manchester, Vt., Oct. 6-9, 1957. C. Lawrence Blakely, 180 Longwood Ave., Boston, Mass., secretary.

Purdue University. Annual short course for veterinarians. Purdue University, West Lafayette, Ind., Oct. 9-11, 1957. L. M. Hutchings, secretary.

Florida State Veterinary Medical Association. Annual meeting. Fort Harrison Hotel, Clearwater, Oct. 13-15, 1957. Robert P. Knowles, 2101 N.W. 25th Ave., Miami 42, Fla., secretary.

University of Missouri. Annual short course for graduate veterinarians, Oct. 14-15, 1957, School of Veterinary Medicine, University of Missouri, Columbia. Cecil Elder, chairman.

Pennsylvania State Veterinary Medical Association. Annual meeting. Hotel Brunswick, Lancaster, Oct. 16-18, 1957, Raymond C. Snyder, N. W. Corner Walnut St. and Copley Rd., Upper Darby, secretary.

Texas Veterinary Medical Association. Annual meeting. Baker Hotel, Dallas, Oct. 16-18, 1957. Paul B. Blunt, 712 Maverick Bldg., San Antonio, Texas, secretary.

Eastern Iowa Veterinary Association. Annual meeting. Hotel Sheraton-Montrose, Cedar Rapids, Oct. 17-18, 1957. F. E. Brutsman, Traer, Iowa, secretary.

Illinois, University of. Annual veterinary conference and short course. School of Veterinary Medicine, University of Illinois, Urbana, Oct. 17-18, 1957. L. E. Boley, chairman.

Southern Veterinary Medical Association. Annual meeting. Hotel Roanoke, Roanoke, Va., Oct. 27-30, 1957. A. A. Husman, P. O. Box 91, Raleigh, N. Car., secretary.

Cornell University. Nutrition conference. Cornell University, Ithaca, N.Y., Oct. 31-Nov. 1, 1957. J. K. Loosli, Stocking Hall, Cornell University, Ithaca, N.Y., chairman.

Animal Care Panel. Annual meeting. Bellevue Hotel, San Francisco, Calif., Nov. 7-9, 1957. R. J. Flynn, Box 299, Lemont, Ill.

Kansas Veterinary Medical Association. Annual convention. Hotel Broadview, Wichita, Jan. 12-14, 1958. K. Maynard Curts, 5236 Delmar Ave., Kansas City 3, Kan., secretary.

Intermountain Veterinary Medical Association. Annual meeting. Hotel Utah, Salt Lake City, Jan. 16-18, 1958. R. A. Bagley, 4600 Creek View Dr., Murray, Utah, secretary.

Minnesota Veterinary Medical Association. Annual meeting, St. Paul, Jan. 20-22, 1958. B. S. Pomeroy, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn.

North Carolina State College. Conference for veterinarians. North Carolina State College, Raleigh, Jan. 28-31, 1958. C. D. Grinnells, chairman.

Oregon Veterinary Medical Association. Winter meeting. Portland, Jan. 31-Feb. 1, 1958. Edward L. Holden, P. O. Box 445, Oswego, secretary.

Foreign Meetings

British Veterinary Association, Annual congress. University of Cambridge, Cambridge, England, Aug. 25-31, 1957. Mr. F. Knight, 7, Mansfield St., Portland Place, London, W, 1, general secretary.

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. B. M. Lauderdale, Montgomery, secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the third Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2. Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Alameda Contra Costa Veterinary Medical Association, last Wednesday of each month. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. Maurice L. Boevers, 3394 Mt. Diablo Blvd., Lafayette, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. A. L. Irwin, 301 Taft Highway, Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. R. C. Lawson, 4040 El Camino, Palo Alto, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, secretary.

Santa Clara Valley Veterinary Association, the fourth Tuesday of each month. Kay Beulley, N. Fourth and Gish Rd., San Jose, Calif., secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5000 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Central Florida Veterinary Medical Association, the first Tuesday of each month, time and place specified monthly. Jack H. McElyer, 5925 Edgewater Drive, Orlando, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodsons Restaurant. P. S. Roy, 4443 Atlantic Blvd., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. T. R. Geci, 108B Catherine Ave., Pensacola, Fla., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. J. J. McCarthy, 500-25th Street, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Frank Mueller, Jr., 4148 E. 8th Ave., Hialeah, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month, Hotel Thomas, Gainesville. W. B. Martin, Jr., 3002 N. W. 6th St., Gainesville, Fla., secretary.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. A. E. Hixon, 131 Mary St., Daytona Beach, Fla., secretary.

GEORGIA—Atlanta Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December.

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Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P. O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. H. V. Henderson, Reinbeck, Iowa, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

East Central Iowa Veterinary Medical Society, the second Tuesday of every month. Dr. W. T. Rugger, Oxford, secretary.

Fayette County Veterinary Association, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

KANSAS—Kansas City Veterinary Medical Association and Kansas City Small Animal Hospital Association, the third Tuesday of each month. Robert E. Guilfoil, 18 N. 2nd St., Kansas City 18, Kansas, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. L. S. Shirrell, Versailles Rd., Frankfort, secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month in Louisville or within a radius of 50 miles. W. E. Bewley, P.O. Box "H," Crestwood, secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

MICHIGAN—Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Allen B. Shopmaker, 136 N. Meramec, Clayton 5, Mo., secretary.

Kansas City Veterinary Medical Association and Kansas City Small Animal Hospital Association, the third Tuesday of each month. Robert E. Guilfoil, 18 N. 2nd St., Kansas City 18, Kansas, secretary.

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Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck. James R. Tanzola, Upper Saddle River, secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. G. R. Muller, 43 Church St., Lambertville, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the third Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. W. E. Snyder, E. Kings Highway and Munn Ave., Haddonfield, secretary.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

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Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. Joseph A. Lombardo, 411 Woodlawn Ave., Greensboro, secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. John G. Martin, Boone, N. Car., secretary.

Twin Carolinas Veterinary Medical Association, the third Thursday of each month in the Orange Bowl Restaurant, Rockingham, N. Car., at 7:30 p.m. James R. Burgess, Rockingham, N. Car., secretary.

OHIO—Cuyahoga County Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

Stark County Veterinary Association, the second Monday of each month. M. L. Willen, 4423 Tuscarawas St., Canton, Ohio, secretary.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Forrest H. Stockton, 2716 S.W. 29th St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Don L. Hohmann, 538 S. Madison St., Tulsa, Okla., secretary.

PENNSYLVANIA—Del-High Veterinary Medical Association, the first Thursday of each month. Stewart Rockwell, 10th and Chestnut Sts., Emmaus, Pa., secretary.

Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

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REFERENCES: 1. Mosier, J. E.: Vet. M. 50:605 (Nov.) 1955.
2. Belloff, G. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956.
3. Pollock, S.: J. Am. Vet. M. Ass. 129:274 (Sept.) 1956.

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What Is Your Diagnosis?

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Make your diagnosis from the picture below—then turn the page ▶

Fig. 1—Radiograph (lateral view) of the thoracic cavity of a dog.

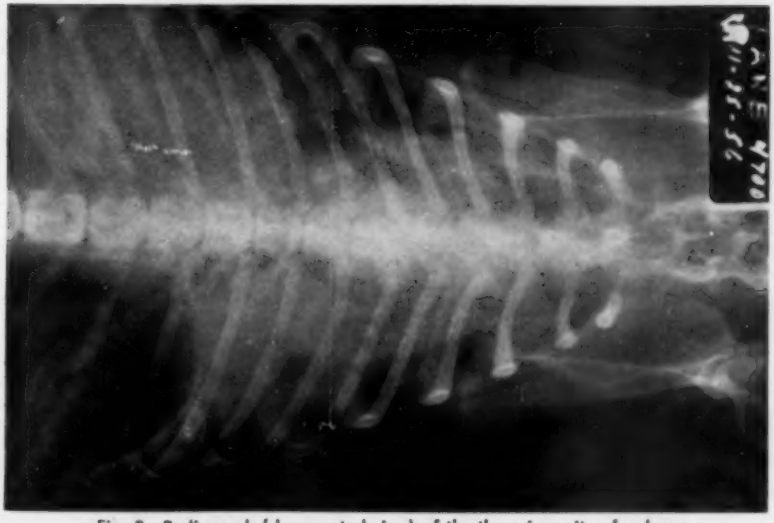

Fig. 2—Radiograph (dorsoventral view) of the thoracic cavity of a dog.

History.—A male, 13½-year-old, mixed Terrier, although in otherwise good health and condition for his age, suffered from dyspnea. The rate and depth of breathing had increased gradually for several weeks. There was no cough but the front legs were turned outward at the elbows. No masses were felt in the abdomen or testicles. Lateral and dorsoventral radiographs of the chest were taken.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—An increase in density is seen in the central and posterior lung fields. Also, a circumscribed nodule is visible at the base of the heart and in the mid-diaphragmatic region. Such lesions are suggestive of tumors or, possibly, abscesses. The latter should be considered if the course of the disease has been febril. (Microscopically, these lesions proved to be bronchiolar (alveolar cell) carcinomas.)

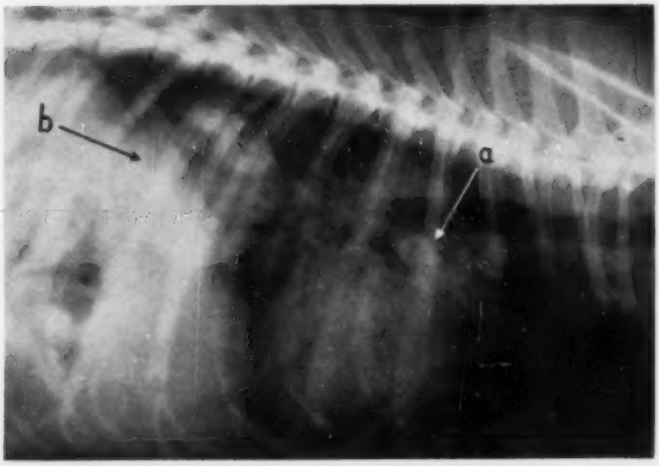

Fig. 3—Radiograph (lateral view) of the thoracic cavity of a dog. Nodule anterior to and at the base of the heart (a); circumscribed lesion in mid-diaphragmatic area of the lung field (b).

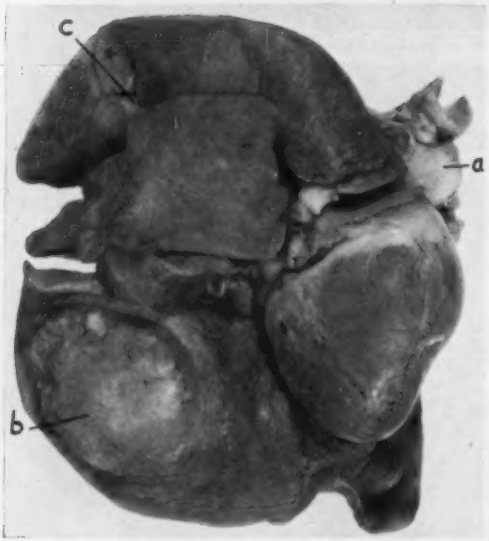

Fig. 4—Photograph of the lungs and heart: mediastinal tumor at the base of heart (a); circumscribed lesion in the right diaphragmatic lobe (b); umbilicated lesions in left diaphragmatic lobe (c).

Comments.—No treatment was advised. Euthanasia was performed a few days later when the dyspnea increased. At necropsy,* the lesions were confined to the thoracic cavity. A nodule, found in the mediastinal area anterior to the heart, measured 2 cm. in diameter (fig. 3a and 4a). It was firm and white. Neoplastic tissue was also present in the diaphragmatic lobes of both lungs (fig. 3b, 4b, and 4c). The lesion in the left lung was umbilicated and dense and, on incision, was firm, gray, and resisted cutting. The lesion in the right lung was circular, pale, fluctuating, and bulged from the lung surface. It proved to be an abscess containing purulent, necrotic material. The periphery consisted of pale, dense neoplastic tissue. Such a lesion is called a cancer abscess.

Microscopically, these peculiar pulmonary lesions proved to be what has been referred to as "pulmonary adenomatosis" or "alveolar cell carcinoma".** These tumors differ from other primary pulmonary neoplasms in that there is no demonstrable focus from a bronchus and also in that the distribution of mucin-forming cells is such that they form a lining for numerous alveoli.[1]

These pulmonary lesions have been described in man, sheep, goats, mice, guinea pigs, and horses. Parasites and nonspecific irritants have often been cited as causes.[2] However, in sheep the condition has been considered to be infectious. The probability that these are true tumors should not be excluded.

*Necropsy performed by Dr. Russell A. Runnells, Kalamazoo, Mich., formerly of Michigan State University.

**Microscopic diagnosis by members of the pathology staff, Wesley Memorial Hospital, and Department of Pathology, Northwestern University, School of Medicine, Chicago.

[1]Laipply, T. C., Sherrick, J. C., and Cape, W. E.: Bronchiolar (Alveolar Cell) Tumors. A.M.A. Arch. Path. 59, (1955): 35-50.

[2]Cowdry, E. V., and Marsh, H.: Comparative Pathology of South African Jagziekte and Montana Progressive Pneumonia of Sheep. J. Exptl. Med., 45, (1927): 571.

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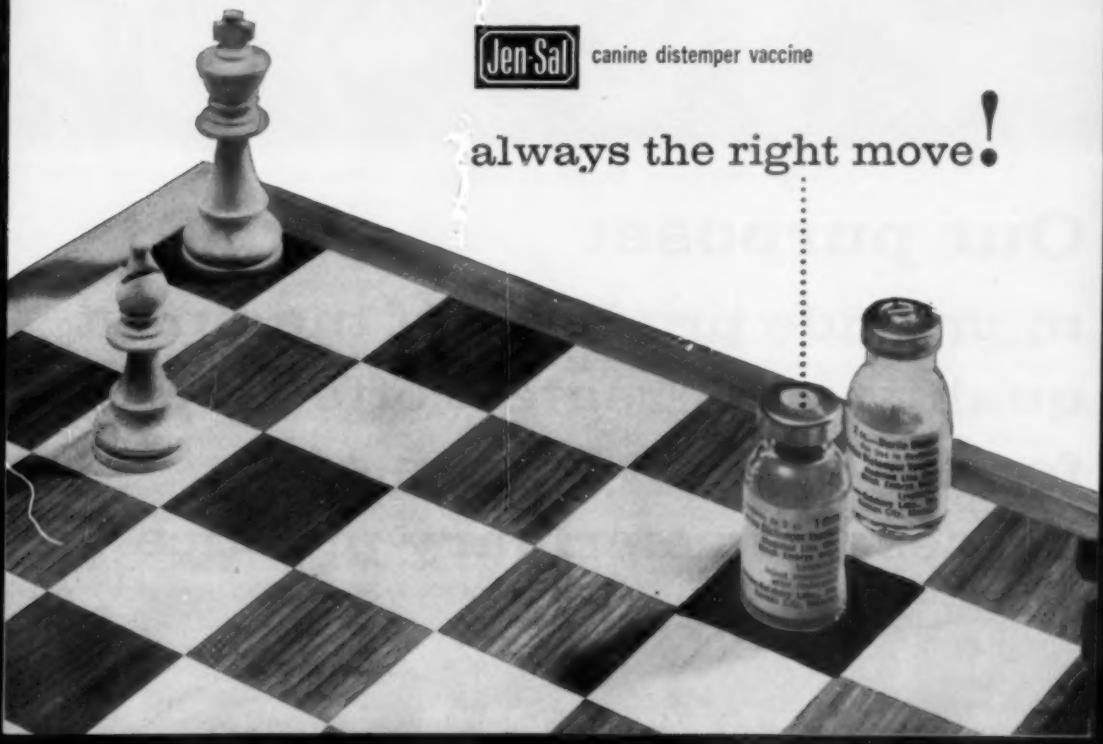

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Northern Virginia Veterinary Society, the second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month. I. D. Wilson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle, Wash. William S. Green, 9637 S. E. 36th, Mercer Island, Wash., secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. O. L. Bailey, P. O. Box 906, Olympia, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W. Huntington, W. Va., secretary.

Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.). R. J. O'Hern, P. O. Box 617, Cumberland, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

WISCONSIN—Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madison, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month. W. E. Lyle, P. O. Box 107, Deerfield, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curtis, 419 Cook St., Portage, Wis., secretary.

Wisconsin Valley Veterinary Medical Association, the second Tuesday of every other month. E. S. Scobell, Rt. 2, Wausau, Wis., secretary.

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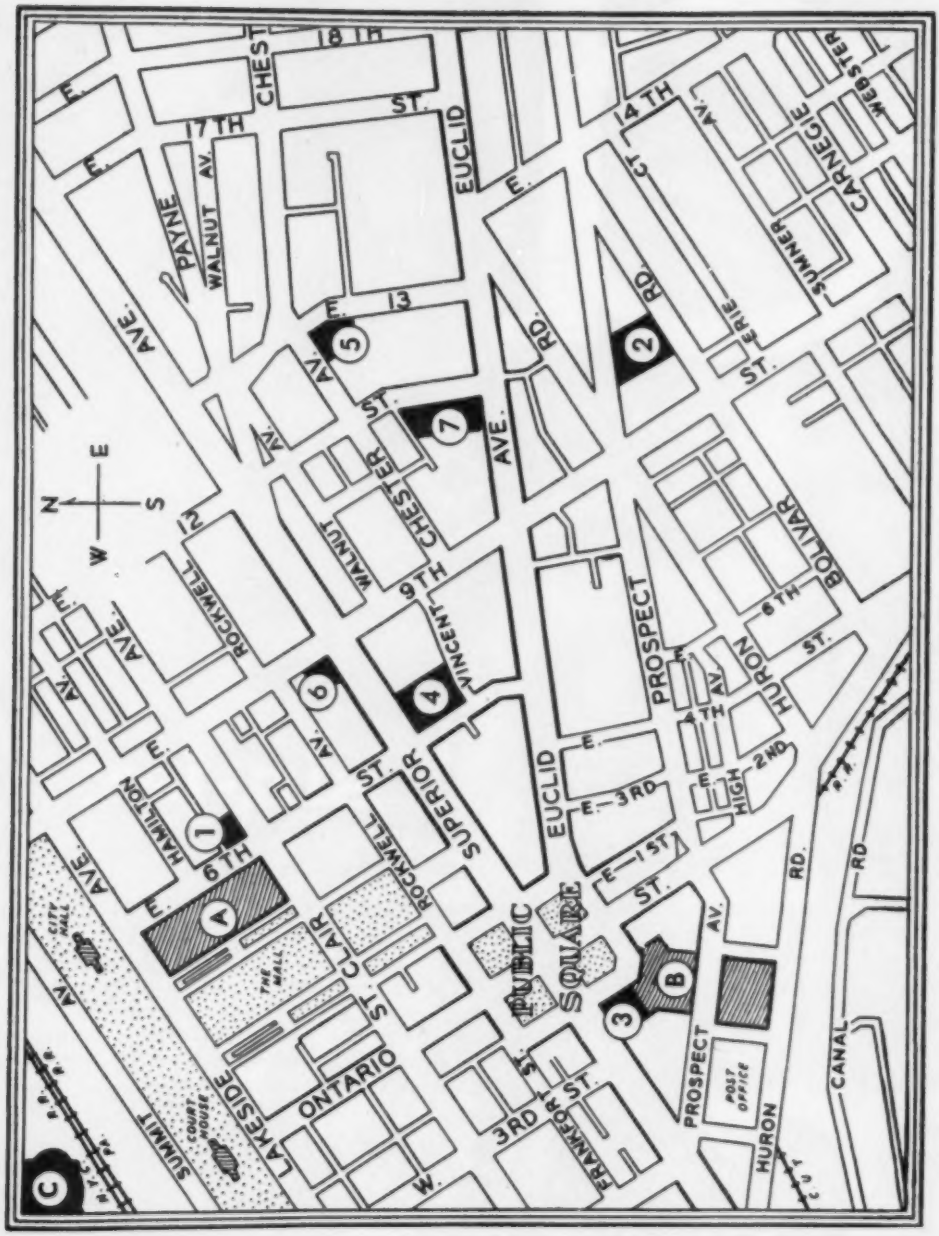

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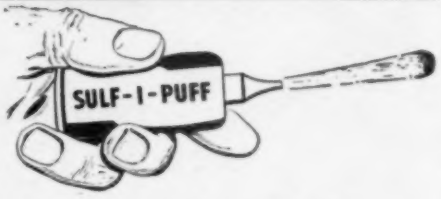

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[1]J.A.M.A., 155, 17, Aug. 21, 1954
[2]Burns, J.J., Schulert, A., Chenkin, T., Goldman, A., and Brodie, B.B.: J. Pharmacol. & Exper. Therap., 100, 530, 1952
[3]Lieberman, L.L.: J. Am. Vet. M.A., 125, 128, 1954
[4]Joshua: Vet. Rec., Jan. 21, 1956
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